



EUROPEAN CENTRAL BANK

EUROSYSTEM

The future of central banking

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Vitor Constâncio

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Opening remarks at the colloquium in honour of Vítor Constâncio

By Mario Draghi¹

Dear Vítor,

Dear friends and colleagues,

Ladies and gentlemen,

It is my pleasure to welcome you all today to this colloquium in honour of Vítor Constâncio. And it also a pleasure to welcome back so many colleagues and friends who have come to celebrate with us.

Your presence here, and your contributions to what promises to be a highly relevant and interesting debate, demonstrate the level of regard in which Vítor is held, and the respect we all have for him.

So it is fitting that we will discuss “the future of central banking” in the coming days. Because there are at least three ways in which some of old certainties of central banking are now being challenged.

First, we are going through a period where the nature of money itself is being re-examined, and with it the role of central banks in society.

This is visible in discussions about the role of non-banks in money creation, or about the disruptive potential of digital currencies. Such currencies are seen by some as a way to disintermediate central banks, and by others as a way for central banks to play an even more dominant role in society – think of the “sovereign money”/ “Vollgeld” initiative that will be put to a vote of the Swiss people in three weeks’ time.

So it is not merely intellectually rewarding to discuss the future of money and monetary policy, but a matter of profound policy relevance.

Second, our conceptual frame of reference and analytical bedrock – macroeconomics – faces some fundamental questions.

There are questions about the suitability and capacity of macroeconomics to help us understand the complexities of the world. And there are doubts, especially among the public, about the usefulness and legitimacy of the policy advice stemming from such analysis – a problem that Vítor has often pointed out.

It is therefore right that we discuss the future of macroeconomics, and that we remain open to new perspectives. And this is particularly key for us as central banks because,

¹ President of the European Central Bank.

as technocratic institutions, our legitimacy rests on the analytical framework of macroeconomics being solid.

Third, our external political and economic environment is changing rapidly, and in ways that affect central banks profoundly.

As Europeans, we are used to be part of an evolving structure. The very goal of the European Union – to create “an ever closer Union among the peoples of Europe” – already embeds this dynamic element. But the past years of crisis have completely changed the nature of this process.

On the one hand, integration has accelerated, especially within the euro area: we have enhanced economic governance, a Banking Union, and greater pan-European solidarity.

On the other hand, we are witnessing increasing political divergence and fragmentation, disputes about fundamental values, and dissent about the very goal of being in this Union together. And the same is true also for the international environment.

So, again, it is essential that we deepen our understanding of the dynamics that are at work – and what this implies for policy.

These are all themes that the colloquium will take up. And thanks to the draw of Vítor, we are privileged to have so many prominent speakers to offer their insights.

But before we get going, and to frame our forthcoming discussions, it might be worth recalling where we stood when you, Vítor, took up your position as ECB Vice-President, in June 2010 and what we have gone through together.

Back then, the euro area economy was recovering from the post-Lehman shock and the deep recession of 2009. The economy was growing by 1.7%; inflation was at 1.6%; our policy rate was at 1.00%.

We had just begun to understand what had led to the financial crisis, and were establishing the European Systemic Risk Board here at the ECB. The word “macro-prudential” started to enter a wider usage. Minds were very much focused on how to avoid the next crisis.

But of course, for us in the euro area, the crisis was only beginning – and this led to a period of unprecedented challenges for monetary policy, and unprecedented responses from the ECB.

First, we had to address the breakdown in monetary policy transmission caused by fears about the break-up of the euro area.

Thereafter, we had to tackle the aftermath of this conflagration: high unemployment, stagnant growth and too-low inflation.

And we also had to implement one of the main institutional responses to the crisis: the creation of European banking supervision.

So this was among the most difficult and challenging years we have faced in central banking, at least in our lifetimes. But we were privileged to have Vítor at the helm to help navigate us through them.

You were able to shoulder this enormous responsibility because of your learning, your experience and your dedication.

First of all, your learning. Those who know you cannot fail to be impressed by your intellectual depth and analytical rigour.

Not only did you bring to the ECB a strong background in economics, both as a student and professor, but your ability to stay abreast of the latest research – and connect it with policy – has been remarkable.

Often you have been among the first to explore ideas that have subsequently become mainstream. I can think, for example, of how you shone a light on the distributional aspects of our policy, or of how you made the case for Banking Union well before its adoption.

Equally vital has been your experience as both a statesman and a central banker.

Entering politics in the turbulent years following the Portuguese revolution in the 1970s, you were no stranger to assuming responsibility in the times of greatest need – not least as Minister of Finance in 1978.

And your experience over the past 18 years within the Eurosystem – first in your capacity as Governor of the Central Bank of Portugal, and since 2010 as Vice-President – has been invaluable to us in charting a course through the rocky terrain we have faced.

You contributed to many key decisions by the Governing Council in those challenging times – indeed, you were often a leader in understanding the way the economy was developing.

Finally, there is your dedication.

Everyone who has worked with you can attest to the passion and commitment you have showed as Vice-President.

Your devotion to our mission, and to the European project, seeps through in everything you do.

It is no surprise that, when European leaders entrusted the ECB with building up European banking supervision, it was you who led the preparatory work and made it the success it is today.

And watching you, Vítor, interact with members of the European Parliament, or colleagues or students, reveals the same enthusiasm: how passionate you are about your arguments, and how important it is for you that your listeners understand what we do and why.

To underscore just how important this is let me quote Alan Blinder, who once noted that:

Relative to their economic and therefore social importance, central banks must be among the least well understood institutions in the entire world. For example, I have been told that millions of Americans still think that the Federal Reserve System is a system of government-owned forests and wildlife preserves where, presumably, bulls and bears and hawks and doves frolic together in blissful harmony. [...] I can assure you that that is not the case.”

Our Governing Council may include a similar range of species, but I trust its purpose is slightly better understood! If so, that is in no small part to the efforts of Vítor and others to connect our mission to the public.

Obviously we have regard and respect for his remarkable contributions to public life, and more appropriately for having dedicated his whole life to serving the public interest. But there is, in my view, a deeper reason for the regard and respect and affection we have for Vítor. And that is his intellectual honesty, which shows in two ways: his immediate, instinctive disgust for dogmatism, that stubbornness in one’s view that disregards any evidence that may contradict one’s convictions; that intellectual laziness, that leads some people to never change their mind. “When the facts change, I change my mind, what do you do Sir?” could well apply to Vítor. But don’t get me wrong, he is far from being a cultural relativist, without value judgements. His interpretation of reality may change but the angle from which he looks at it doesn’t: It is always the people and their welfare. Humanity rather than intellectual dryness is Vítor’s dominant feature, and that’s why beyond regard and respect, what we all have for you Vítor is affection.

Ladies and Gentlemen, let me conclude,

At this point it might be tempting to say that the ECB, and Europe, would be a poorer place without you, but it wouldn’t be true, you know it and everybody who knows you knows it as well: with your curiosity and your courage you will far from disappear as you will continue to challenge us, our policies, our convictions until you see the world and Europe turn your way.

Arrivederci Vítor, and thank you very much.

The future of macroeconomics

By John Muellbauer¹

Abstract

New Keynesian DSGE models, fashionable with central banks, have too long ignored the insights of the Information Economics Revolution to which Joseph Stiglitz made seminal contributions. Further, these models have failed to assimilate important research insights from encompassing alternative theories, model selection and the implications of structural breaks, to which econometric literature David Hendry is a key contributor. This paper summarises the critique. After responding to a recent counter-attack on critics of New Keynesian DSGE models, it shows how evidence-based research can improve quantitative policy models allowing central banks to have a better understanding of financial stability, and to improve inflation models and forecasts. In particular, household sector equation systems for consumption, balances sheets and asset prices are able to explain the amplification mechanisms that put some countries at greater risk of financial instability. And new evidence from forecasting US core inflation suggests that with appropriate controls, a stable relationship between unemployment and inflation is revealed, though not between the policy rate and inflation. This empirical evidence is consistent with arguments advanced in recent years by the ECB's retiring Vice President Vítor Constâncio.

1 Introduction

Given the wider theme of the colloquium, I concentrate on quantitative models used or potentially used at central banks to guide policy. My thinking on these issues since the 1970s was particularly influenced by the work of Joseph Stiglitz on 'information economics' and of David Hendry on how better to learn from data and avoid the key pitfalls when forecasting. These are my two most significant intellectual influences in quantitative macroeconomics. In his Nobel lecture, Stiglitz (2001) wrote: "In the 70s, economists became increasingly critical of traditional Keynesian ideas, partly because of their assumed lack of micro-foundations. The attempt made to construct a new macroeconomics based on *traditional* microeconomics, with its assumptions of

¹ Nuffield College, and Institute for New Economic Thinking at the Oxford Martin School, University of Oxford, U.K. This paper draws on research over years with co-authors Janine Aron, the late Gavin Cameron, Valerie Chauvin, John Duca, Felix Geiger, David Hendry, Keiko Murata, Anthony Murphy, Manuel Rupperecht and David Williams and I am grateful to them all. Section 4 borrows from current work with Janine Aron and I am immensely grateful to her. Recent discussions with John Duca have also been very helpful as have comments from Philipp Hartmann and David Hendry. The research in Section 3 was partly the product of a project pursued at the ECB during my tenure of a Wim Duisenberg Visiting Fellowship. Longer-term research support from the Open Society Foundation via INET at the Oxford Martin School is gratefully acknowledged.

well-functioning markets, was doomed to failure. Recessions and depressions, accompanied by massive unemployment, were symptomatic of ... market failures....If individuals could easily smooth their consumption by borrowing at safe rates of interest, then the relatively slight loss of lifetime income caused by an interruption of work of six months or a year would hardly be a problem; but the unemployed do not have access to capital markets, at least not at reasonable terms, and thus unemployment is a cause of enormous stress. If markets were perfect, individuals could buy private insurance against these risks; yet it is obvious that they cannot. Thus, one of the main developments to follow from this line of research into the consequences of information imperfections for the functioning of markets is the construction of *macroeconomic* models that help explain why the economy amplifies shocks and makes them persistent, and why there may be, even in competitive equilibrium, unemployment and credit rationing.”

In the same lecture, he suggests: “Information economics has alerted us to the fact that history matters; there are important hysteresis effects. Random events – the black plague – have consequences that are irreversible. Dynamics may be better described by evolutionary processes and models, than by equilibrium processes. And while it may be difficult to describe fully these evolutionary processes, this much is already clear: there is no reason to believe that they are, in any general sense, ‘optimal’.”

On learning from data, as his research over many decades has demonstrated, Hendry (2017) argues: “There is a false belief that data-based model selection is a subterfuge of scoundrels—rather than the key to understanding the complexities of macro-economies”. On forecasting, he wrote in 2011: “Economic forecasting is inevitably carried out using (unknowingly) mis-specified models, in the face of unanticipated location shifts....much of the existing empirical evidence on forecast performance can be accounted for by a theory which allows for both features, using parameter estimates based on mis-measured data.”

There are very important insights embodied in these quotations, though largely ignored among macroeconomists and at central banks in the quantitative models and research methodologies until recently fashionable. The 2018 (Spring) issue of the *Oxford Review of Economic Policy*, marking 10 years since the global financial crisis, is devoted to the controversies around different methodological approaches in macroeconomics. It includes critiques from Olivier Blanchard, Joseph Stiglitz, Simon Wren-Lewis and David Hendry and myself of the New Keynesian, representative agent, dynamic stochastic general equilibrium (DSGE) models used in many central banks in recent years. Defences in the issue include those from Ricardo Reis and Jesper Linde.

The June issue of the *Journal of Economic Perspectives*, also marking this 10-year anniversary, is another significant mile-stone. Gertler and Gilchrist trace the history of the crisis, and note the importance of the financial accelerator operating through the household sector and interacting with spill-over effects within the banking system. Mian and Sufi review the extensive microeconomic evidence for the role of credit shifts in the US sub-prime crisis and the constraining effect of high household debt levels. They summarise this as the “credit-driven household demand channel”. Kaplan and Violante spell out implications of heterogeneous agent models incorporating

idiosyncratic, uninsurable income risk, credit and liquidity constraints, and discuss the limitations of existing models and unresolved research questions, for example on asset pricing and labour market income risk. They acknowledge that current versions of the heterogeneous agent New Keynesian model still “miss the potentially large wealth effects on consumption for wealthy households that can arise from changes in asset prices”.

In the same issue, Christiano et al. revise and tone down their widely circulated defence of the DSGE approach, Christiano et al. (2017). In what might be described as a sleight of hand, Christiano et al. (2017), label all quantitative models aiming to capture general equilibrium phenomena, as ‘DSGE’, and call those who work outside this framework, ‘dilettantes’. This ignores the fact that increasing numbers of central banks use large ‘semi-structural’ econometric models of the macro-economy that do *not* assume specific micro-optimising behaviour and do not adopt the assumption of rational expectations common to all agents, both generally adopted in DSGE models. It also ignores the ‘suite of models’ approach, including forecasting models for specific sectors, widely used at central banks. Finally, they mistakenly conflate general equilibrium theory models, designed to give often useful insights into a particular set of mechanisms, with the quantitative models that encompass the main variables of interest to central banks. In Section 2 of this paper, I tackle head-on the issues they raise.

In the remainder of the paper, I address two central concerns of central bankers: financial stability, and the understanding and forecasting of inflation and of business cycles as represented by fluctuations in GDP. I argue that the *conventional practices* in how the macro-profession is allowed to learn from data have led to failures by central bankers in making adequate progress on such concerns. The profession has been forced into a schizophrenic condition. On one hand, the combination of the Lucas critique and the demand for tractable micro-foundations for full general equilibrium forces heavy *restrictions* on models. These are imposed by the omission of major channels and imposing Bayesian priors in model estimation, and at the extreme, resorting to calibration. On the other hand, Sims ‘incredible restrictions’ critique of large econometric policy models in his 1980 paper on *Macroeconomics and Reality*, proposed to let data speak with minimal *a priori* restrictions, by estimation of loosely-parameterised VAR models. However, the curse of dimensionality then leads to making restrictive assumptions by limiting both the set of relevant variables and the lag-length, and once again to Bayesian restrictions to reduce the impact of that curse. *Both* methodological options create mis-specified models through omissions and heavily limit what can be learned from data.

These issues are critically addressed in Sections 3 to 5. Section 3 discusses financial stability, and how a broader perspective on empirical evidence for the personal sector and its linkages with providers of credit can provide clearer insights into economic issues, particularly with regard to the financial accelerator. For instance, such a perspective can explain how differences in institutions between countries are related to differing risks of instability, rather than assuming away these key institutional differences as is often done.

In Section 4, the empirical evidence on modelling and forecasting US inflation (currently pre-occupying markets) is re-examined from this broader empirical perspective. In Aron and Muellbauer (2018), substantial improvements in forecasting performance are found using indicators of institutional changes in market power (union density and industry concentration), a broad set of relevant drivers of core inflation including the levels of relative prices, and ‘Parsimonious Longer Lags’ (PLL). Simple restrictions on the lag structure save parameters and allow larger sets of candidate regressors and longer lags to be considered. We find strong evidence that the inflation process involves longer lags than conventionally thought relevant, supporting similar results by Gordon (2009, 2013). We also reconsider the highly debated question of whether there is a relationship, let alone a stable relationship, between core inflation and the level of US unemployment. Farmer and Nicolò (2018) have recently proposed a Keynesian model without a Phillips curve, by which they mean the New Keynesian Phillips Curve (NKPC). We agree that the NKPC is unstable, but conclude that at least since the late 1970s there has been a relatively stable relation between US core inflation and the level of unemployment, *provided the right controls are included for other drivers of inflation*.

Section 5 gives an example of how a more flexible approach to learning from data can also substantially improve forecasts of household income and of GDP. The findings hint that path dependence is a major issue for growth and the business cycle.

Empirical evidence on the personal sector and its linkages with credit supply and these forecasting results throw light on economic processes, which should enhance the formulation of the new generation of large macro-econometric models. In particular, section 3 points to the need to relax the net worth constraint commonly imposed to model consumption, to control for shifts in credit conditions, and use better models of house prices and residential investment. The Federal Reserve’s FRB-US model could be greatly improved in these directions. Section 4 suggests that the price and wage sector of such models could be improved from the insights of more comprehensive inflation models. Section 5 suggests a more flexible approach is needed to explain the evolution of capacity and that growth and the business cycle might be more intimately connected than often assumed. This also affects how one can model households’ evolving perceptions of ‘permanent income’ in a world of evolutionary and sometimes abrupt change.

2 DSGE models and ‘dilettantism’

The New Keynesian DSGE models that have dominated the macroeconomic profession and central bank thinking for the last two decades are based on the principle of formal derivation from micro-foundations.² They assume an optimising behaviour of consumers and firms consistent with rational or ‘model-consistent’ expectations of future conditions. To produce a tractable model, it is further assumed that the behaviour of firms corresponds to that of a ‘representative’ firm and of

² An exposition of “the celebration of the ‘Science of Monetary Policy’” is given in Clarida et al. (1999).

consumers to a 'representative' consumer. In turn, this entails ignoring the necessarily heterogeneous credit or liquidity constraints that in practice bind both on firms and consumers. Another assumption to obtain tractable solutions is that of a stable long-run equilibrium trend path for the economy. If the economy is never far from such a path, the role of uncertainty would necessarily be limited. Hence, popular pre-global financial crisis versions of the model could exclude banking and finance, taking as given that finance and asset prices were a mere by-product of the real economy. A competitive economy is assumed but with a number of distortions, including nominal rigidities (sluggish price adjustment) and monopolistic competition. This distinguishes New Keynesian DSGE models from the preceding general equilibrium Real Business Cycle models (RBC). The range of stochastic shocks that could disturb the economy is also expanded relative to the productivity or taste shocks of the RBC model. Some DSGE models calibrate values of the parameters; but where the parameters are estimated, Bayesian system-wide estimation is used, imposing substantial prior restrictions to achieve parameter values that are deemed 'reasonable'.

Taking a plain-spoken and critical view of the New Keynesian Dynamic Stochastic General Equilibrium models, one finds they are *not stochastic enough* – as they trivialise the role of uncertainty and heterogeneity, are *not dynamic enough* – as they miss key lags in relationships, and are *not really general equilibrium* – as they ignore important feed-back loops, seen for example in the global financial crisis. They are *scarcely new*, being based on ideas made redundant by the asymmetric information revolution of the 1970s and 80s, and *hardly Keynesian*, as they miss co-ordination failures in labour and financial markets. As argued in Hendry and Muellbauer (2018), and by Stiglitz (2018), the specific flaws³ of the NK-DSGE model can be summarised under six headings:

1. The micro-foundations are built on sand, ignoring the information economics revolution and assuming complete markets

Stiglitz's prescient 2001 Nobel Prize lecture and Stiglitz (2018) spell out the importance of incomplete markets⁴ and asymmetric information in real-world economics. Of particular interest are the implications of credit and liquidity constraints for household behaviour. Research by Deaton (1991) and Carroll, in a series of papers beginning with Carroll (1992), shows that given uninsurable individual income risk and the liquidity constraints that result from asymmetric information, households will engage in buffer-stock behaviour to ameliorate income risk, and they discount expected future income at higher rates than assumed by the textbook model. This behaviour has profound implications for the effectiveness of monetary and fiscal policy. In contrast, in NK-DSGE models, households discount temporary fluctuations in income to maintain spending in the face of shocks, thus providing a stabilising anchor to the economy.

³ Muellbauer (2010) puts forward a broadly similar critique.

⁴ Buiter (2009), in his trenchant post-crisis critique of standard macroeconomics, highlights the complete market assumption as the central failing of New Keynesian DSGE models.

2. The micro-foundations are built on sand, assuming representative agents

In the real macro-economy, heterogeneity rules. It is well-known that the conditions under which ‘average behaviour’ of households is the same as that of an individually-optimising household are highly restrictive. There are many examples of the general point that even the *functional form* which holds at the micro-level can be radically different from that holding at the aggregate level, when aggregating across heterogeneous agents.⁵ The combination of asymmetric information and household inequality mean that income processes, liquidity constraints faced by households, and asset ownership are all highly heterogeneous. It is nevertheless facile to suggest that aggregate data is therefore uninformative: but aggregate models need to be richer and encompass the extensive as well as intensive margins of behaviour. To illustrate, the aggregate mortgage debt to GDP ratio depends *both* on the average debt of households which hold mortgages (the intensive margin) and the fraction of those with a mortgage (the extensive margin). There is no reason why a function designed to explain the former should also explain the latter. But an aggregate model for mortgage debt should capture both features of the data. Aggregate models could use micro-data or assumptions about the forms of the micro distribution of data to address the implications of stochastic aggregation.⁶

Another example illustrates the informational content in aggregate data. The incidence of unemployment is highly heterogeneous and so is price setting. For example, pricing practices for rents, medical and insurance services, clothing and electronic products are all likely to differ. Despite this heterogeneity, as we show in Section 4, there is a surprisingly stable relationship between aggregate unemployment and aggregate core inflation, provided the right controls are included in the inflation equation.

3. The rational expectations assumption is incompatible with a world of structural breaks and radical uncertainty.

Structural changes, frequent and widespread in every economy, are a key source of forecast error. It is therefore wildly implausible to endow agents with rational expectations that foresee such breaks. To quote: “*The mathematical basis of DSGEs fails when events suddenly shift the underlying distributions of relevant variables. The ‘law of iterated expectations’ becomes invalid because an essential, but usually unstated, assumption in its derivation is that the distributions involved stay the same over time. Economic analyses with conditional expectations (‘rational expectations’) and inter-temporal derivations then also fail, so DSGEs become unreliable when they are most needed.*”⁷ Heterogeneity at the micro-level suggests that for model-consistent expectations, individuals would need not only to forecast their own *individual* heterogeneous circumstances but also *aggregate* circumstances. The latter,

⁵ Hendry and Muellbauer (2018, p. 295) give two such examples: Houthakker (1956) and Bertola and Caballero (1990).

⁶ One example is Aron and Muellbauer (2016) who estimate a distributional form for negative equity from a micro-snapshot to generate time-series estimates of the aggregate proportion of mortgages with negative equity based on aggregate debt/equity ratios. This proves highly significant in explaining the proportion of defaults and foreclosures in the UK.

⁷ As reported by Hendry and Muellbauer (2018, p. 299-301), summarising the conclusions of Hendry and Mizon (2014).

and potentially both, are subject to structural breaks in, for example, technology, credit conditions, monetary and fiscal policy rules, globalization, and trade union power. As Caballero (2010) pointed out, the ‘pretence of knowledge’ was extreme in the NK-DSGE approach, both on the side of the modeller and on the side of the agents populating the model economy.

Forecasting failures are well-known in macro-economics (Loungani, 2001; Ahir and Loungani, 2014), so that even *pre*-crisis, model-consistent expectations are highly unrealistic. Loungani (2001) concludes: “the record of failure to predict recessions is virtually unblemished”. This does not preclude economic agents from forecasting. But it does mean those forecasts are best represented by simpler, limited information forecasting models, even if agents often get those forecasts wrong.

4. Omitting shifting credit constraints, household balance sheets, and asset prices, and hence ignoring the financial accelerator

The omission of money, credit, banks and asset prices from the NK-DSGE model led Charles Goodhart to comment: “It excludes everything I am interested in”, see Buiter (2009). The asymmetric information revolution of the 1970s provided micro-foundations for the application of credit constraints by the banking system (Stiglitz, 2018). The use of collateral became increasingly widespread from the 1960s to reduce the asymmetric information problem. This led to a huge rise in real-estate backed lending, transforming the banking sector in most OECD countries (Jordà et al., 2016). For many countries, shifting constraints as applied to collateral became among the most important structural changes in the economy. An unintended side effect was the *shifting of risk*: the micro-risk of asymmetric information between lender and borrower, e.g. adverse selection and moral hazard, was shifted to the macro-risk of real estate price collapses. With hindsight, many US bankers say that their biggest mistake during the mortgage credit boom was not in mis-managing micro-risk but in failing to appreciate that average house prices faced serious down-side risks. Section 3 returns to these themes of financial stability and house price overvaluation.

5. The failure to be structural in the Cowles Commission sense

Haavelmo’s (1944) classic Cowles Commission article on the probability approach in econometrics is the first systematic definition of ‘structural’. Haavelmo contrasts the potential lack of autonomy of empirical regularities in an econometric model with the laws of thermodynamics, friction, and so forth, which are autonomous or ‘structural’ because they ‘describe the functioning of some parts of the mechanism *irrespective* of what happens in some other parts’. Tracing how the New Classical Revolution in macroeconomics gained dominance and the reason large econometric policy models of the 1970s were displaced as policy models by DSGE models, the Lucas (1976) critique proved to be the key (see Wren-Lewis (2018) and Hoover (1994)). Since the parameters of such large policy models were supposedly not ‘structural’, they necessarily changed whenever policy changed. In the reign of the DSGE models, however, there was a subtle shift in the *meaning* of ‘structural’: the definition came to imply ‘micro-founded in individual optimising behaviour’. Hendry and Muellbauer (2018, p. 292-4) observe that with shaky micro-foundations in a world of structural breaks, DSGE models typically fail to maintain parameter stability. Therefore, the

DSGE models also fail to be *structural* in the more fundamental sense of the Cowles Commission.

6. The lack of flexibility of even the newest representative agent DSGEs

The consumption Euler equation is the key mechanism for the operation of model consistent-expectations. This makes it the main *straitjacket* of the representative agent DSGE approach. A much more modular approach, as for example adopted in the non-model consistent version of FRB-US, allows heterogeneity in expectations between households and firms. Within DSGE models resting on an aggregate or sub-aggregate Euler equation⁸, this kind of modularity is hard to achieve.

The attack on critics of New Keynesian DSGE

A recent attack on critics of DSGE models by Christiano et al. (2017) begins with the hard-line label: “people who don’t like DSGE models are dilettantes”.⁹ To define the term, “the dilettante would be content to point out the existence of competing forces” faced with a range of policy questions, such as whether exchange rate depreciation will stimulate an economy. In what looks like a deliberate attempt to obfuscate in their Section 2.1 they suggest: “as a practical matter, people often use the term DSGE models to refer to quantitative models of growth or business cycle fluctuations”. This completely misses the point made by Blanchard (2018)¹⁰ that DSGE models (with their heavy restrictions) should not crowd out research into alternative quantitative models that allow data to speak more freely. Many central banks now use or are developing estimated econometric general equilibrium models that aim to capture the key dynamics and feedback mechanisms operating in real economies. To label such models as ‘DSGE’ can only mislead the uninitiated.

Christiano et al. begin by reviewing DSGE models with their origins and extensions, which attempts to bridge the chasm between their economic assumptions and the real world. Reviewing RBC models and their failings, it is acknowledged that micro-data cast doubt on key assumptions, including perfect credit and insurance markets. New Keynesian DSGE models are briefly introduced, which added nominal frictions in labour and good markets to the RBC model to be able to answer questions such as what are the consequences for output of a monetary policy shock. The Christiano et al. (2005) NK-DSGE model is explained, which has much in common with that of Smets and Wouters (2003, 2007). Christiano et al. acknowledge the representative agent and complete asset market assumptions; they admit that Calvo-style pricing (Calvo, 1983) contradicts aspects of micro-data and makes sense only in moderate inflation environments. In discussing the consumption Euler equation and the need to assume habits to obtain data-coherent responses to interest rate changes, they admit that it

⁸ More recent models sometimes assume two representative households, one is an intertemporal optimiser, and the other is myopic and just spends current income.

⁹ The sentence is absent in a more recent version of the paper.

¹⁰ This article was preceded by widely-read blogs, Blanchard (2016, 2017).

has been known for decades that the Euler equation is rejected by macro-data¹¹, even with habit formation. They defend its use because the representative agent NK-DSGE model gives “roughly the right answer” to the question of how consumption responds to a cut in interest rates: “a useful reduced-form way of capturing the implications of ...more realistic, micro-founded models”. However, if reduced-form methods are *permitted* by the hard-line DSGE school, there are surely better ways of learning from the data, see Section 3 below.

They then attempt to convince that financial frictions were adequately dealt with by some of these models. They castigate Stiglitz (2018) amongst others who “...asserted that pre-crisis DSGE models did not allow for financial frictions, liquidity-constrained consumers, or a housing sector”. They cite selected counter-examples, including models with two types of consumers: those both unconstrained by liquidity and rational and forward-looking, and those who are credit-constrained and just spend income. But micro-theory does not say that credit-rationed consumers only spend income; this assertion is not micro-founded, and the example is inadequate to try to justify financial frictions in these models. This kind of ad hocery has long been anathema to the developers of the micro-founded buffer stock model, Deaton and Carroll.

Christiano et al. refer also to DSGE models with firm-based credit market frictions introduced by Bernanke et al. (1999) and incorporated in Christiano et al. (2003). However, for reasons of tractability, these are ‘Mickey Mouse’ *single*-period financial frictions. They cannot adequately capture reality when debt contracts are typically multi-period and bankruptcy and defaults have major scarring effects on economies. More damagingly, these DSGE models are almost always linearised around steady states, which assume for this Utopian world that major financial crises *cannot occur*.

Finally, they appeal to the introduction of a housing market and a financial friction into a DSGE model by Iacoviello (2005), later calibrated to US data in Iacoviello and Neri (2010). There is no denying that this widely-cited work is a technical *tour de force*. However, these extended DSGE models actually illustrate the weaknesses of representative agent, efficient market rational expectations models. They assume two representative households, patient and impatient, and present in a fixed proportion. Patient households apply a loan-to-value constraint when offering mortgage loans to the impatient households, which is a kind of financial friction. However, given their assumption of infinitely-lived or dynastic households, saving for a down-payment, one of the most important saving motives in industrial countries, is omitted from the model. Their closed economy model lacks banks and housing foreclosures, and assumes a frictionless and efficient housing market; the transmission and amplification of monetary or other shocks via housing is therefore *extremely* limited. Their model implies that aggregate home equity withdrawal (i.e. the excess of households’ mortgage borrowing over acquisitions of housing), is always negative. However in practice, US home equity withdrawal was *strongly positive* for much of 2001 to 2006,

¹¹ At the 2017 Oxford-NYRB conference, Christiano referred to the Euler equation as “the most rejected equation in economics”.

and in the peak quarters, it was of the order of 10 per cent of that quarter's aggregate household income.

This important fact and the realised foreclosures were not in the set of salient data chosen by Iacoviello and Neri for their model calibration. For their calibrated model, they compare the correlation between consumption growth and house price growth, with and without the financial friction. Without the friction, the correlation is 0.099, the result of the common influence of the shocks on house prices and consumption. With the friction, the correlation rises to 0.123. The difference is tiny and the implication is that the much-lauded financial friction hardly matters. Even more troubling is the assumption in these models that there are random changes in peoples' tastes which made them strongly prefer housing compared to their taste in the past in order to explain the house price boom of the 2000s. Since there are no credit shocks in the model, these *preference shocks* are the main variables that can explain movements in house prices. Unsurprisingly the house price dynamics in these models poorly capture the persistence and volatility in the *actual* data. To treat preference shocks as a euphemism for credit market shocks, including the financial innovations and credit crunches induced by bad loans, distracts seriously from understanding the real world.

After the partisan review, Christiano et al. discuss the estimation and evaluation of DSGE models. One strategy is to minimise the distance between a subset of model-implied second moments and their analogues in the data, or minimising the distance between model and data impulses to economic shocks, using partially identified VAR models. The choice of which moments to match is subjective, and analogous to the problem of omission of salient data in the Iacoviello-Neri model just discussed. A second problem is that many VAR models are grossly mis-specified by omitting longer lags¹², creating the delusion that estimated DSGE parameters are data-coherent, when they also fail to capture longer lags. The Bayesian methods they recommend for DSGE models therefore suffer from similar problems to the Bayesian VARs. Both, as noted earlier, are far from immune to structural breaks in the data and the Hendry-Mizon critique (Hendry and Mizon, 2014).

Stiglitz is right to criticise the use of the Hodrick-Prescott filter to de-trend the data which was common before the financial crisis. The crisis made its weaknesses obvious, though authors such as Canova had earlier pointed to the problem of sweeping "medium-term business cycles into the trend". Christiano et al. cite one example of a pre-crisis paper that did not fall into this trap. Stiglitz, citing Korinek (2017), is surely right to point to the subjectivity involved in choosing which moments to match, when that is the method used for estimation. Stiglitz argues, citing Korinek that "for a given set of moments, there is no well-defined statistic to measure goodness of fit of a DSGE model". Of course, classical maximum likelihood would provide such a measure but, quoting Christiano et al. themselves: "the data used for estimation is relatively uninformative about the value of some of the parameters in DSGE models". Bayesian methods used to deal with this rely on subjectivity. The need for tractability means the choice of variables to be modelled is typically quite narrow and also subjective, usually excluding credit aggregates, asset prices and balance

¹² I argue this point in more detail in Sections 4 and 5 below.

sheets. Stiglitz's last point is that "DSGE models frequently impose a number of restrictions that are in direct conflict with micro evidence". The defence that all models have such inconsistencies hardly washes when those inconsistencies are often gross, in particular contradicting evidence supporting the insights of the information economics revolution.

Christiano et al. ask why DSGE models failed to predict the financial crisis, though almost all quantitative models failed. They admit that pre-crisis models did not sufficiently emphasise financial frictions, noting that those included in DSGE models, e.g. those based on Bernanke et al. (1999) had only modest quantitative effects. Some of the reasons for this were discussed above and overlap with the same issues faced by Iacoviello (2005). They consider the post-crisis developments in the DSGE literature, starting with the introduction of more serious financial frictions. One example, allowing a roll-over crisis in the shadow-banking sector, is Gertler et al. (2016), though this is more of a calibrated theory model designed to understand a mechanism than a general policy model. Such models have an important function. A second example is Christiano et al. (2014) which introduces a time-varying variance of technology shocks amplified by a Bernanke-Gertler-Gilchrist-style financial friction and estimated on data including equity prices and interest rate spreads. They conclude that their second-moment shock substantially reduces the implausible pre-crisis attribution of most of business cycle variation in GDP to technology shocks. However, it is doubtful if any plausible model of the US economy can exclude the housing market and the structural changes in credit markets, discussed in section 3 below. Fortunately, there is now a spate of research, much of it framed in terms of heterogeneous agents, taking housing and the mortgage market more seriously, including Hedlund et al. (2016), of which more below.

They turn to the zero lower bound (ZLB) and other non-linearities. They note that DSGE models with enough frictions can generate strong fiscal policy effectiveness when the ZLB holds and discuss solution methods that do not rely on the log-linear approximations criticised by Stiglitz and many others. They complain that very recent DSGE literature deals with such criticisms and Stiglitz needs to catch up on his reading. They also criticise his comment "the inability of the DSGE model to...provide policy guidance on how to deal with the consequences [of the crisis], precipitated current dissatisfaction with the model". However, while the DSGE literature on the ZLB gives the right advice on fiscal policy effectiveness, it remains silent on bank rescues, easing constraints in the mortgage market and helping borrowers with mortgage payment difficulties. In practice, rescues of financial institutions and QE or 'credit easing', particularly purchases of agency bonds secured on housing collateral, proved important. The Federal Home Administration system, in providing publicly-backed mortgage credit to partially compensate for the almost complete collapse of the private mortgage-backed securities market, played a pivotal role in stabilising the US economy. These facts are not mentioned by Christiano et al. (2018).

New developments of heterogeneous agent models at last begin to incorporate key insights from the asymmetric information revolution to which Stiglitz was the key contributor. It is clear that Stiglitz's critique was focused on representative agent NK-DSGE models, and he surely must welcome this new generation of

heterogeneous agent models. Nevertheless, these models are still at the stage of being calibrated theory models designed to explain key mechanisms. For example, the important Heterogeneous Agent New Keynesian (HANK) paper by Kaplan et al. (2018) gives major insights into monetary transmission without relying on implausible substitution effects of the representative agent NK-DSGE model, see the discussion in Kaplan and Violante (2018). However, housing is treated like an illiquid financial asset subject to major trading costs and credit constraints and with an exogenous price. This therefore omits the important monetary transmission channel that exists through the US housing market. Hedlund et al. (2016) are making progress designing a model with more realistic housing market features, including matching frictions and sticky prices.

Christiano et al. discuss how DSGE models are used at policy institutions, but fail to mention that the non-DSGE FRB-US model continues to be heavily used (despite its defects discussed in the next section), and that many including the Bank of Canada, ECB, Dutch National Bank, and the Australian RBA¹³ have developed or are developing non-DSGE policy models.

In their conclusion, Christiano et al. mention “exciting work on deviations from conventional rational expectations (including) social learning, adaptive learning and relaxing the assumptions of common knowledge” as part of the organic development of the DSGE enterprise. One can only celebrate such developments. Without doubt, much useful and creative work is being done with structural models to better understand particular mechanisms. Whether embedding them in a necessarily over-simplified full general equilibrium setting is always helpful is questionable.¹⁴ There are, of course, fine examples where it is necessary, for example in Brunnermeier and Sannikov (2014). In their general equilibrium model, which includes a banking sector, low fundamental risk leads to higher equilibrium leverage: low risk environments are conducive to a greater build-up of systemic risk, arguably relevant to the Great Moderation period from the mid-1980s to 2006. There have been other major advances in post-crisis general equilibrium macro theory but translation into usable policy models for central banks has not yet occurred.

Carlin and Soskice (2018) set out a stylised macroeconomic model with two well-defined solutions, one Keynesian and one Wicksellian, and a graphical tool-kit which aids comprehension. It includes some of the essential ingredients with which a large econometric policy model should be consistent and therefore capable of providing an explanation of the slowness of the recovery since the global financial crisis. Their Keynesian unemployment equilibrium is underpinned by five

¹³ The paper (Cusbert and Kendall, 2018) introducing the new model says: “A weakness of DSGE models is that they often do not fit the data as well as other models, and the causal mechanisms do not always correspond to how economists and policymakers think the economy really works. In order to more easily manage these models, they typically focus on only a few key variables, which can limit the range of situations where they are useful. The key strength of full-system econometric models like MARTIN is that they are flexible enough to incorporate the causal mechanisms that policymakers believe are important and fit the observable relationships in the data reasonably well. They can also be applied very broadly to model a wide range of variables. This flexibility reflects that the model is not derived from a single theoretical framework, which can make causal mechanisms less clear than in DSGE models.”

¹⁴ For example, the structural heterogeneous agent model of leverage and mortgage foreclosures of Corbae and Quintin (2015) assumes exogenous house prices. Its admirably crafted balance between realism concerning the banking sector and heterogeneity of borrowers and tractability could not have been achieved had it also been required to supply a full general equilibrium treatment.

assumptions: a zero bound to interest rates; the absence of disinflation in the presence of high unemployment; strategic complementarities among investors capable of giving rise to multiple equilibria; the assumption that technical progress is embodied in investment so that a low-investment outcome will give rise to a low rate of technical progress and finally, agents who discount expected future income at higher rates than assumed by the textbook model, which as noted above has profound implications for the effectiveness of monetary and fiscal policy. In chapter 6 of Carlin and Soskice (2015), they introduce a leveraged banking sector and hence the possibility of a destabilizing financial cycle, see section 3 below, that can take the economy away from the Wicksellian equilibrium.

Finally, given heterogeneity, the DSGE programme is far from offering the only way forward. Haldane and Turrell (2018) make a strong case for agent-based modelling, which is firmly founded on micro-data. Economic agents in these models are assumed to use heuristic behavioural rules given the limited information they face, rather than assuming that they can successfully and continuously accomplish the heroic task of solving complex intertemporal optimising problems.

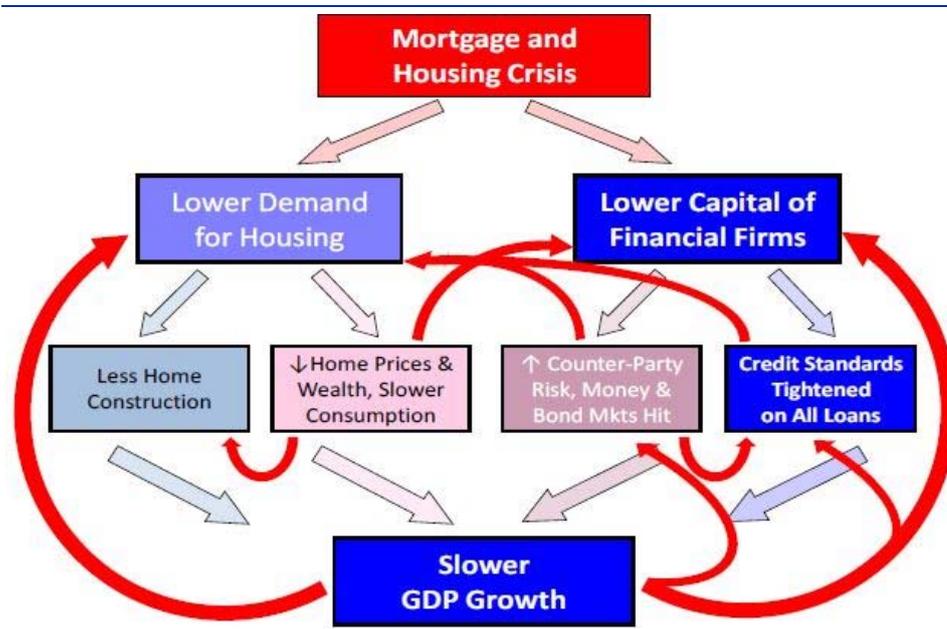
3 Financial stability: lessons from modelling consumption, debt and house prices

The US sub-prime crisis began with a serious problem of *over-valuation* of asset prices, especially of housing. The different types of over-valuation are discussed below. The consequence of overvaluation, eventually is falling house prices. Falling house prices reduce residential investment and lower consumer spending in the US, where housing collateral is an important driver of consumption. These are the two left channels shown in Figure 1, illustrating the feedback loops in the US sub-prime crisis. Falling house prices increased bad loans and lowered the capital of financial firms. This raised risk spreads in credit markets and impaired the ability of banks to extend credit, shown in the two right channels of Figure 1. This fed back on residential investment and household spending, as shown in the figure, increasing unemployment and reducing GDP, and this, in turn, fed back further to reduce the demand for housing, shown in the extreme left arrow in the figure, and the capital of financial firms, shown in the extreme right arrow.

Such feedback loops involve non-linearities as well as amplification. For example, a fall in house prices that drives up the incidence of negative equity, can, via bad loans, cause a *sharper* contraction in credit availability than the expansion of credit availability caused by an equivalent rise in house prices.

Figure 1

The financial accelerator in the US sub-prime crisis



Source: John Duca, from Duca and Muellbauer, 2013.

One can classify the causes of overvaluation of asset prices into three broad groups: exogenous macroeconomic shocks, fragile fundamentals and endogenous dynamic processes, see Muellbauer (2012) for discussion.

Exogenous negative macroeconomic shocks to economic fundamentals are one reason why, with hindsight, house prices can be seen to have been overvalued. Such shocks can include a deterioration in the terms of trade, a rise in oil prices for net oil importers (e.g. in the 1970s), a collapse of export markets (e.g. Finland just after the collapse of the Soviet Union), a rise in global interest rates for a small open economy,¹⁵ external credit supply shocks for small open economies, political risk, and natural disasters. Such shocks are arguably close to unforeseeable.

A dislocation of economic fundamentals, which historical experience *should* have flagged as increasingly fragile, is a second category promoting overvaluation of prices. Examples are: duration mis-match in credit supply (e.g. mortgage funding in Ireland and the UK disrupted by the money-market sudden stop in August 2007); currency mis-match of debt;¹⁶ and unsustainably weak financial regulation (e.g., the misuse of securitisation and fraud in the UK and the US before the global financial crisis).

The third group concerns endogenous, dynamic economic feedbacks, which in some contexts, as in the US sub-prime crisis, can amplify the impact of external shocks. These feedbacks can vary both across countries and over time. The speeds of the

¹⁵ Examples include the Reagan fiscal shock in the early 1980s and the German unification shock of the early 1990s). Such shocks have particularly strong effects for such economies where floating rate debt dominates.

¹⁶ For example, in the Baltic republics and Hungary in the global financial crisis, and the Asian financial crisis of the late 1990s.

different feedbacks can be very important: for example, if an amplifying feedback is large and immediate, but a negative feedback slow but persistent, financial instability is more likely.

3.1 The role of endogenous feedbacks

Consider first the negative endogenous feedbacks that can be generated during a house price boom. One instance of such a feedback on prices stems from a build-up in debt levels as the *quality* of loans to households and property developers deteriorates, especially in liberal-credit environments. High debt levels limit spending and access to further credit. A second endogenous, negative and persistent feedback arises if there are large, credit-funded expansions in housing stocks, which then weigh down on house prices. Examples include Ireland, Spain and parts of the US in 2000-2006, where oversupply remained a problem for several years. A third negative feedback via aggregate demand occurs in economies in which high down-payment ratios are required of mortgage borrowers: then saving rates of would-be home-owners increase when house prices rise relative to income. A fourth negative feedback occurs in economies where property taxes are closely linked with very recent market values, dampening aggregate demand and sapping returns from housing investment. Such negative feedbacks would be stabilising if they operated quickly enough or were not overwhelmed by the amplifying feedbacks that *can* boost the upswing in that phase of the financial cycle, discussed next.

Turning to the amplifying endogenous feedbacks, consider first the role of extrapolative expectations. The role of user cost, which measures the interest cost of borrowing relative to expected appreciation, in the demand for durable goods such as housing has long been studied. There is now much evidence that market participants often tend to extrapolate past rates of appreciation in forming expectations of appreciation to come. Then a series of positive shocks, for example in access to credit or in falling interest rates, increasing the rate of appreciation of house prices, later generates a fall in user cost, increasing the demand for housing and feeding back onto house prices. This was an important ingredient in the over-valuation in US house prices from the mid-2000s according to evidence from Duca et al. (2011, 2016).¹⁷ Since lower down-payment ratios enhance the returns from a housing investment financed by a mortgage, this kind of over-shooting in house price dynamics is likely to be greater in countries where low down-payment ratios are prevalent and time varying as loan conditions are eased.¹⁸ Such amplifying feedbacks also exacerbate down-turns of the cycle after prices have started falling.

Though Figure 1 shows consequences of negative shocks on an overvalued housing market, it also reflects similar, but opposite signed, feedbacks operating in the

¹⁷ Regular quarterly surveys of the housing-price expectations of potential housing-market participants should help assess overshooting linked to extrapolative expectations, and Case and Shiller's expectations surveys led to their real-time judgment of overvaluation in the US in the mid-2000s.

¹⁸ Empirical evidence for this point comes from Muellbauer and Murphy (1996) and Chauvin and Muellbauer (2018).

upswing of a housing market.¹⁹ A second amplifying feedback potentially comes from the mechanisms illustrated on the right hand side of Figure 1. Higher expected appreciation can make lenders more keen to lend as borrowers would have more equity against their mortgage, making the loan safer from the lender's point of view. Moreover, in a rising market, lending is more profitable and previous bad loans shrink, enhancing the capital of financial firms. As Geanakoplos (2010) has argued, an endogenous leverage cycle can simultaneously drive growth in debt and house prices.

A third amplifying feedback, illustrated in the extreme left channel of Figure 1 comes with an increase in residential investment, which boosts employment and household income, and therefore aggregate demand, including demand for housing. In countries where planning constraints are severe or the planning process slow, this short-term feedback is likely to be smaller, though the impact of demand shocks on house prices in the presence of inelastic supply is greater.

A fourth, but also *far from universal*, amplifying feedback comes from the consumption channel feeding into aggregate demand, illustrated in the second from left channel in Figure 1. This tends to be greater where down-payment constraints are loose, i.e. household leverage higher, access to home equity loans is easy and rates of owner-occupation are high, as in the US. Research on consumption functions to check for balance sheet effects, including from housing, is helpful in establishing in which countries amplifying feedback loops are more likely, see Hendry and Muellbauer (2018) for a discussion. Thus, there *can* be pronounced overshooting of house prices induced by a series of strong positive shocks, amplified by the four mechanisms just discussed.

As explained above, a house price boom *can* also generate some negative feedbacks which would be stabilising if they acted quickly enough. If they do not, their very persistence can then create a double whammy of a crisis, when combined with the quickly acting feedbacks that amplify house prices falls in the downturn.

The role of leverage at the level of households in these feedback mechanisms was noted. The more a financial system permits or fosters high leverage at financial firms, the more likely is it that it will also be high at the level of households or non-financial firms. For financial firms, high leverage increases risks, particularly those arising from sizable overvaluation of property prices, given the important role of real estate collateral for lending. A factor that increased leverage at financial firms was the shift in governance within large investment banks, mainly in the 1980s, from partnerships, where managers were owners who retained substantial 'skin in the game,' to public corporations where managers had incentives to design asymmetric contracts for their private gain. Duca et al. (2016) attribute the rise in loan-to-value ratios for first-time buyers in the US in the 2000s to leverage-increasing interventions: the 2000 Financial Futures Modernisation Act²⁰, lower bank capital requirements on 'investment grade' nonprime mortgage backed securities and the 2004 Securities and Exchange

¹⁹ Evidence in Duca et al (2016) suggests an asymmetry, with stronger effects of falling house prices on the contraction of credit supply, than of rising prices on its expansion.

²⁰ This gave derivatives first priority in claims on a company's assets ahead of other claimants, thus encouraging the use of derivatives to back the expansion of mortgage-backed securities.

Commission decision to loosen leverage restrictions on investment and other banks. Tendencies for excess debt leverage can also be exacerbated by tax systems which incentivise borrowing (e.g. through tax relief on mortgage payments available for owner-occupiers in the U.S. and the Netherlands, though not in Canada or Australia) and legal frameworks that protect borrowers with limited or no-recourse loan contracts (as is still the case in many U.S. states, but rare elsewhere).

Macro-evidence has accumulated for the role of leverage and of real estate connected financial instability (Cerutti et al. (2017) and Mian et al. (2017)). Mian and Sufi (2014) have provided extensive microeconomic evidence for the role of credit shifts in the US sub-prime crisis and the constraining effect of high household debt levels. Turner (2015) analyses the role of debt internationally with more general mechanisms, as well as in explaining the poor recovery from the global financial crisis. Jordà et al. (2016) have drawn attention to the increasing role of real estate collateral in bank lending in most advanced countries and in financial crises. The IMF's October 2017 Financial Stability Report provides further evidence, highlighting the critical role of mortgage debt and non-linearity, finding more pronounced effects at high debt ratios, and larger effects in countries with open capital accounts, fixed exchange rate regimes, less transparent credit registries (information), and less strict financial supervision. The IMF also found that easy monetary policy during a credit boom likely exacerbated the subsequent down-turn when booms turn into busts.

3.2 Implications for econometric policy models

For policy models to be useful in allowing for the mechanisms discussed above, they need well-specified household sector equations, including for consumption, mortgage debt and house prices, a well-specified residential investment equation and a linkage between the financial sector and credit availability for the household and investment sectors. As noted in Section 2, New Keynesian DSGE models, omitted debt and household balance sheets, including housing, together with shifts in credit availability, crucial for understanding consumption and macroeconomic fluctuations. The US Federal Reserve did not abandon its large non-DSGE econometric policy model FRB-US. However, it too was defective in that it also relied on the representative agent permanent income hypothesis for the major part of consumption²¹, which ignored shifts in credit constraints and mistakenly lumped all elements of household balance sheets, debt, liquid assets, illiquid financial assets (including pension assets), and housing wealth into a single net worth measure of wealth.

This is wrong for the following reasons. First, housing is a consumption good as well as an asset, so consumption responds differently to a rise in housing wealth than to an increase in financial wealth, Aron et al. (2012). Second, different assets have different degrees of 'spendability'. It is indisputable that cash is more spendable than pension or stock market wealth, the latter subject to asset price uncertainty and access restrictions or trading costs. This suggests estimating separate marginal propensities

²¹ It allowed a fraction of households just to spend income.

to spend out of liquid and illiquid financial assets. Third, the marginal effect of debt on spending is unlikely just to be minus that of either illiquid financial or housing wealth. The reason is that debt is not subject to price uncertainty and it has long-term servicing and default risk implications, with typically highly adverse consequences, disproportionately affecting the most leveraged households.

There is now strong micro evidence that the effect of housing wealth on consumption, where it exists, is much more of a collateral effect than a wealth effect, see Browning et al. (2013), Mian et al. (2013), Windsor et al. (2015), Mian and Sufi (2016) and Burrows (2018). As mortgage credit constraints vary over time, this contradicts the time-invariant housing wealth effect embodied in FRB-US.

Of structural changes, the evolution and revolution of credit market architecture is often the single most important. In the US, credit card ownership and instalment credit spread between the 1960s and the 2000s. The government-sponsored enterprises—Fannie Mae and Freddie Mac—were recast after 1968 to underwrite mortgages. Interest rate ceilings were lifted in the early 1980s. Falling IT costs transformed payment and credit screening systems in the 1980s and 1990s. As the discussion of factors permitting increased leverage in the US showed, there were major shifts in credit availability in the late 1990s and early 2000s. These shifts occurred in the political context of pressure to extend credit to the poor.

Given the lessons of the information revolution and the work on liquidity constraints of Deaton and Carroll, it is clear that the text-book micro-foundations of the standard life-cycle/permanent income model do not stand up. Using the log-linear approximation as in Muellbauer and Lattimore (1995), the text-book model takes the form

$$\ln(c_t/y_t) = \alpha_0 + \ln(y_t^p/y_t) + \gamma A_{t-1}/y_t \quad (1)$$

where c is consumption, y is non-property income, y^p is permanent non-property income using a discount rate equal to the real rate of interest, and A is net worth. The marginal propensity to spend out of net worth is γ . If one is unsure about the theoretical foundations, the ‘encompassing principle’, see Hendry and Muellbauer (2018), p. 313, suggests relaxing and testing the restrictions implied by a model. Thus, the asset to income ratio can be split into the main components, e.g. liquid assets, debt, illiquid financial wealth and housing wealth; the coefficient on the log ratio of permanent to current income can be freely estimated instead of being imposed at one, and a higher average discount rate checked, as implied by Deaton and Carroll’s work on buffer-stock saving; the intercept can be allowed to vary with access to credit since this would affect the saving for a down-payment motive, the size of which might also depend on house prices relative to income; and the marginal propensity of housing wealth can be allowed to shift with access to borrowing on home equity. In a series of papers, my co-authors and I have found support for these generalisations and major differences between economies in the connection between house prices or housing wealth and consumption. For Japan, Germany, France and even Canada, there appears to be a negative effect of higher house prices/income on consumption, though there is also a small housing wealth effect in France. In all these countries apart from Japan, credit liberalisation for households has increased the consumption to income

ratio, though Germany had only a quite modest degree of liberalisation. In contrast, for the US, UK, Australia and South Africa, the marginal propensity to spend out of housing is positive and varies strongly with access to credit. In all cases, the marginal propensity to spend out of liquid assets is higher than out of illiquid assets, and debt has a far more powerful negative effect on consumption than implied by the net worth restriction.

These papers are examples of the looser, more relevant, application of theory. In contrast to the FRB-US consumption function which incorporates no shifts in credit constraints and aggregates the household balance sheet into a single net worth concept, contradicted by micro evidence, it no longer corresponds to a representative agent optimizing model. The FRB-US model followed Muellbauer and Lattimore (1995) in assuming two types of agents, one following a life-cycle model on the lines of equation (1), albeit with a higher risk-adjusted discount rate to compute permanent income, and the other simply spending income. However, it disregarded our evidence that the marginal propensity to consume (*mpc*) is higher for liquid assets and that the *mpc* for debt is large and negative, and our theoretical explanation of why the housing wealth effect is different from a financial wealth effect (Muellbauer and Lattimore, 1995, p. 268-271). It took no account of our arguments that “Financial liberalization, by making asset backed credit more easily available, made these illiquid assets more spendable” (p. 281) and “...improved access to... home loans, and reduced down payment to house price ratios” (p. 289).

The claimed micro-foundations of the FRB-US consumption function do not save it from parameter instability: the estimated speed of adjustment for data up to 2009 of 0.19 falls to 0.10 for recent data. This is clear evidence against treating the FRB-US consumption function as a ‘structural’ equation in the classical sense of invariant to shifts in the economic environment. As a result of its omissions, the FRB-US model failed to give proper warning of risks faced by the US economy after 2007. At the Jackson Hole conference in 2007, Mishkin (2008) reported the results of FRB-US simulations of a 20 per cent decline in real house prices spread over 2007–8. The standard version of the model simulated GDP lower than the baseline by 0.25 per cent in early 2009 and consumption lower by only 0.6 per cent in late 2009 and 2010. The simulations suggested a rapid recovery of residential investment given the lowering of the policy rate in response to the slowing economy. FRB-US failed to include a plausible model of house prices and so also missed the feedback from the credit crunch back on to house prices modelled in Duca et al. (2011, 2016). Consistent with this time series evidence, Favara and Imbs (2015) and Anundsen and Heeboll (2016) provide strong micro-evidence for the causal link between credit supply and house prices in the US.

3.3 The LIVES approach to modelling the household sector

A number of our papers use the ‘latent interactive variable equation system (LIVES)’ set out in Duca and Muellbauer (2013), with the fullest application in the six-equation system in Geiger et al. (2016) and Chauvin and Muellbauer (2018). Consumption, consumer credit, housing loans, house prices, liquid assets and permanent income

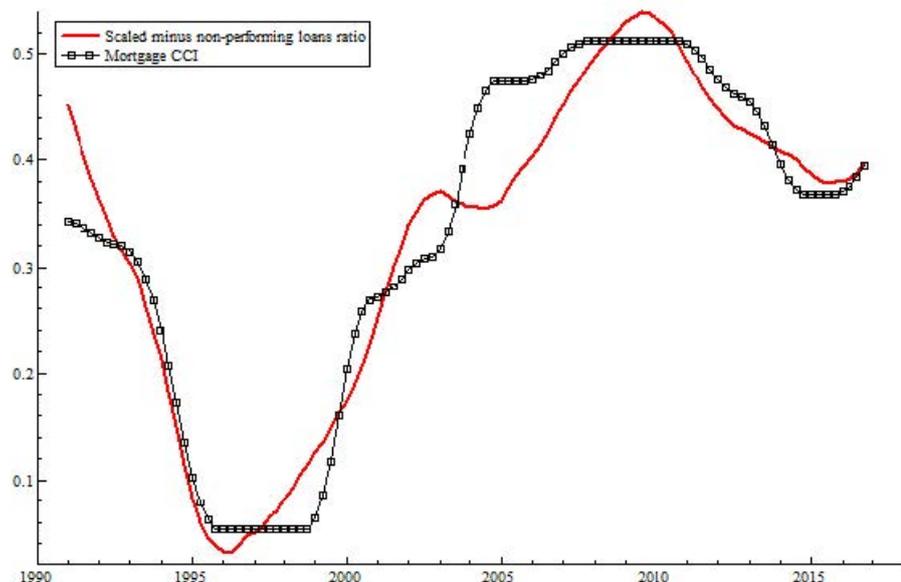
are jointly modelled with two latent variables, representing shifts in consumer credit and mortgage credit availability, common to a number of the equations. This model takes to the macro data what Mian and Sufi (2018) call the 'credit-driven household demand channel' and quantifies the role of household balance sheets in the financial accelerator, emphasised by Gertler and Gilchrist (2018). Including a measure for permanent income, a measure of households' income growth expectations, is important, providing protection against the Lucas critique. Section 5 below will say more about the practicalities of modelling it.

Mortgage credit conditions help drive house prices, housing loans and consumption in France, though demography is also important. Without controlling for mortgage credit conditions, it is impossible to obtain coherent estimates of a house price equation for France. The latent variables can be estimated using state space methods or spline functions. Because they represent any joint drivers of the three variables not otherwise controlled for, there can be doubts about whether they reflect specifically shifts in credit conditions. However, the mortgage credit conditions index for France in Chauvin and Muellbauer (2018) turns up strongly from 1984, when widely documented financial liberalisation began in France. And after 1990, it is strongly negatively correlated with the ratio of non-performing loans, particularly when credit availability contracts, as the following Figure demonstrates.

Figure 2

Scaled negative non-performing loan ratio and estimated mortgage credit conditions index

(8-quarter moving average, lagged 2 quarters)



Source: Chauvin and Muellbauer (2018).

The six-equation model is highly relevant for thinking about potential risks for financial stability in France from the housing-credit nexus. The consumption estimates for France suggest that in the house price boom between 1996 and 2008, the positive

effect on the ratio of consumption to income of higher housing wealth relative to income, a small but positive housing wealth effect, and looser mortgage credit conditions, was largely offset by the negative effect on consumption of higher house prices and higher debt relative to income. France, like Germany where the negative effect of higher house prices to income is even larger, see Geiger et al. (2016), is therefore very different from the Anglo-Saxon economies where home equity loans produced large collateral effects of housing wealth on consumption. As a result, despite higher house prices, France did not experience an Anglo-Saxon-style consumption boom in which the financial accelerator via home equity loans proved powerful and destabilising. Moreover, the induced increase in household debt will weigh negatively on future consumption.

Extrapolative expectations of capital gains, which enter user cost, a driver of demand for housing and hence of house prices, are potentially a powerful endogenous source of house price over-valuations. They were an important factor in the US boom of the 2000s, see Duca et al. (2011, 2016), and probably contributed to excess credit growth. The scale of extrapolative expectations in France was moderate even at the height of the French boom, as shown in the estimated user cost contribution in Chauvin and Muellbauer (2018). Since higher leverage amplifies returns from house price appreciation, the moderate contribution of such expectations is probably the result of the far lower level of leverage permitted to households by French financial regulators.

Our six-equation model does not endogenise credit conditions, but Figure 2 suggests there would strong potential in endogenising the NPL ratio of the banking system, data permitting, to quantify the link between the household and banking sectors. Moreover, the substantial lag between the NPL ratio and the mortgage credit conditions index, implies that in real time, early warnings would be flagged up well before credit conditions turned down, with negative consequences for house prices and consumption. A top-down macro approach needs to be integrated²² with micro evidence on potential household vulnerabilities and individual bank stress tests data to better tune macro-prudential policies, see Constâncio (2017a, 2018a). Improving the quality of the top-down approach, taking proper account of institutional differences between countries as seen in France compared to Anglo-Saxon countries, would make an important contribution to this endeavour.

It is sometimes argued that the global financial crisis was such a rare event that there is little to be gained in more normal times for building mechanisms into models that trace how such a crisis might affect the household sector. However, not only can such risks not be precluded, but better models of the household and housing sectors throw important light on monetary policy transmission in more normal business cycle fluctuations and on potential obstacles to a strong recovery from high levels of debt and changing demography. They also illuminate potential risks for and via the household sector from other sources, such as a rise in global interest rates and/or a substantial fall in equity prices, see Constâncio (2018a).

²² Constâncio (2017b) says: “Stress tests of the banking and financial system must not be limited to microprudential supervision but need to be embedded in a macro-financial environment and take a macroprudential dimension.”

4 Lessons from forecasting US core inflation

Forecasting is one area of applied economics where practitioners can escape the constraints of conventional practice. The true test of a useful model is its out-of-sample forecast performance, regardless of convention – at least in the absence of major structural breaks, when all forecasting models break down (Clements and Hendry, 2011a). Central banks are perennially interested in forecasting inflation, but especially in 2018, when the US economy may be at a turning point. Aron and Muellbauer (2013) is a forecasting paper that challenged the conventional wisdom, and demonstrated substantial out-performance in forecasting US inflation, including against the unobserved components-stochastic volatility model of Stock and Watson (2007). Forecasting models were estimated for the 12-month-ahead US rate of inflation, measured by the chain-weighted consumer expenditure deflator, for 1974–98 and subsequent pseudo out-of-sample forecasting performance examined. Alternative forecasting approaches for different information sets were compared with several benchmark univariate autoregressive models. Three key ingredients to the out-performance were: including equilibrium correction component terms in relative prices²³; introducing nonlinearities to proxy pre-1983 state-dependence in the inflation process and using a ‘parsimonious longer lags’ parameterization to permit long lags without running into the curse of dimensionality. It was established that applying the standard Bayesian information criterion, commonly used in unrestricted VARs to select lag length, results in throwing away highly relevant longer information. This was a remarkably robust finding, true for each of seven information sets considered. In common with much forecasting literature, it was also concluded that forecast pooling or averaging improves forecast performance.

A paper currently in progress uses similar methods to develop forecasting models for core inflation²⁴, defined by the Federal Reserve’s favourite measure, the PCE deflator, excluding food and energy (Aron and Muellbauer, 2018). These new models for 12-month-ahead core inflation demonstrate similar outperformance against benchmark univariate autoregressive models as those in the 2013 paper. In the earlier paper, three relative price terms were highly important over the 12-month forecasting horizon: two measures of domestic costs relative to the PCE deflator, namely unit labour costs and house prices (a key drivers of rents), and a measure of foreign prices and the exchange rate embedded in the real exchange rate, also a relative price.²⁵ The hypothesis is that, in a long-run equilibrium, the PCE deflator is a function of unit labour costs, house prices (as a proxy for rental costs) and foreign prices, both of imported raw materials and of final consumption goods. Starting from an equilibrium position, if one of these changes, the equilibrium is disturbed and gradual adjustment

²³ In Sargan (1964), on wages and prices in the UK, the equilibrium correction mechanism that underpins much macroeconomic empirical research was introduced. Interestingly, its first application was also to modelling inflation. Hendry (2001) develops this equilibrium correction approach to modelling annual data on the UK GDP deflator back to 1875.

²⁴ See Yellen (2017) for an excellent and comprehensive discussion of controversies and uncertainties around the drivers of core inflation.

²⁵ This has close parallels with Hendry (2001) for whom the long-run solution for the UK price level depends on unit labour costs, foreign prices and commodity prices. Given the UK’s small open economy, the weight on foreign prices is larger than for the US. Allowing for structural breaks, e.g. because of wars, this long-run solution is remarkably stable for long periods.

to a new equilibrium occurs. Since this takes time, these 'equilibrium correction terms' account for a good deal of observed inflation persistence. Lags in the inflation process are likely to be long and complex for at least three reasons. One is that inflation expectations in the form of private sector forecasts of inflation based on past data are likely to be an element in price setting. A second is that house prices feed gradually into rents, given the preponderance of 6 and 12 month rental contracts. A third is that in a multi-sector economy, similar equilibrium adjustment processes will be occurring within and between sectors, for example, related to the input-output structure of the economy as argued by Huang and Liu (2000).

The need for long and complex lags in forecasting inflation is even more apparent with the US core price index, at forecasting horizons of 3, 6, 12 and 24 months. Conventional wisdom among central bankers suggests that there is little information in economic data relevant for forecasting 24 months ahead, beyond the recent inflation history. By contrast, Aron and Muellbauer (2018) show that because real world lags are rather longer than most economists have assumed²⁶, there is relevant information for forecasting US core inflation two years ahead.

A relationship between unit labour costs and unemployment allows the derivation of a strong empirical relationship, given two other controls, between the US core price index and unemployment, relative import prices (alternatively, the real exchange rate) and house prices.²⁷ The two other controls are first, a measure of pricing power²⁸ based on the Herfindahl-Hirschman index of concentration of US public companies, and second, the rate of unionisation (as also found relevant in our 2013 paper). There are short-run drivers including the changes in (logs) of import prices, hourly earnings, the nominal exchange rate, trade-weighted foreign prices, oil prices and non-core prices. A parallel model without union density, but with a strong equilibrium correction term to unit labour costs, also gives a reasonable account of the data.²⁹ This points to a strong relationship between unit labour costs and the unemployment rate, controlling for union density.

A challenge faced in the new paper was dealing with the structural break of the global financial crisis. Clements and Hendry (1998, 2011a) have repeatedly argued that the major cause of forecast failure are structural breaks resulting in a mean shift in I(1) variables. The global financial crisis was a huge shock that also caused major shifts in the structure of the US economy, including lower productivity growth. Real GDP in the US and other OECD countries, even in 2018, was everywhere below pre-crisis trends.

²⁶ Gordon (2009, 2013) and in earlier work, and Hendry (2001) are exceptions.

²⁷ Castle and Hendry (2009) examine very long-run determinant of UK wages, finding a strong but non-linear relationship with the unemployment rate.

²⁸ Grullon et al. (2017) track increasing concentration in US industries from 1972 to 2014. They show a strong association between profit margins and the degree of concentration. We are grateful to them for making available their measure of concentration based on the 3-digit NAICS industrial classification. Dickson (2006) separates the efficiency and market power effects of higher concentration for a panel of 253 US manufacturing industries covering the years 1963 to 1992. Specifically, for given average cost, higher concentration leads to higher prices, but when average cost are relegated to the error term, higher concentration leads to lower prices. Salinger (1990) provides earlier evidence of a link between price increases and firm concentration in US manufacturing.

²⁹ In this version of the model, the effect of the level of the unemployment rate is less strong but the previous 6-month change in the unemployment rate has a strong negative effect.

A post-crisis forecasting model needs to incorporate dummies to allow for the possibility of a shift in the long-run relationship between the relative prices, as well as the temporary disruptions such as those due to inventory liquidations. Post-crisis, forecasting can be resumed, and the comparative pseudo-out-of-sample performance of alternative models evaluated using data up to early 2018.

A key aspect of improving forecasting performance is down to the use of longer lags, and specifically, the 'Parsimonious Longer Lags' (PLL) referred to in various contexts in this paper. As noted in the introduction, while Vector Auto Regression (VAR) models aim to preserve generality by not imposing an *a priori* structure on models, (Sims, 1980), they suffer from the 'curse of dimensionality', as increases in lag lengths or in the number of variables included rapidly raise the number of parameters to be estimated. In practice, the gain in generality comes at the cost of restricting the number of variables and lag lengths.

An improved trade-off between these objectives in the context of a VAR can be obtained through the use of PLL which imposes credible restrictions. Since a 'multi-step' model³⁰ for forecasting inflation, here 12-months-ahead, can be regarded as *one* equation in a reduced form of a VAR, applying the PLL restrictions achieves such an improved trade-off in the forecasting context. The PLL used in the 2013 and 2018 versions of the US forecasting equations takes the following form: for variables in differences, free coefficients are allowed on the first 3 monthly changes; for lags at three to six months, these are restricted to the 3 month change or $\Delta 3$, and to $\Delta 6$ if six to 12 months, and to $\Delta 12$ if 12 months or longer.³¹ The intuition behind these simple and easy to implement restrictions is that precision in the exact timing of impulse responses is harder and harder to achieve, the longer the lag. However, rather than ignoring longer lags, it is better to include them even if the timing is not exactly optimal. Compared to unrestricted lags on changes in variables up to 23 months, 24 parameters are thus replaced by six parameters. Several different information sets of increasing complexity are modelled, and in the most general set of these, the levels of the relative prices (in logs), the unemployment rate, the concentration index and trade union density also appear.

The forecasting performance of the models for core US inflation are contrasted by comparing three different methodologies in terms of reported root mean square forecast errors. Each methodology is applied to the same range of information sets, including at its simplest, a univariate set in core inflation. The first methodology uses an unrestricted standard AR(k+1) or VAR(k+1) specification for inflation rates, with the lag length selected by the Bayesian information criterion.³² This model is contrasted with a restricted model applying the parsimonious and longer lag (PLL) structure, allowing lags up to 24 months. The third methodology averages the forecasts from the

³⁰ Multi-step models for inflation forecasting were popularised by Stock and Watson (1999, 2003).

³¹ Gordon (2013), and in his earlier work, uses a similar idea to PLL in a quarterly context. In his inflation model, moving averages of lagged inflation at lags of 1, 5, 9, and even longer, summarise the longer run information in the data. His model does not include levels variables such as relative prices but does include a stochastic trend: the deviation of the unemployment rate from this stochastic trend is central to explaining inflation.

³² It is standard in the VAR and the multi-step forecasting literature based on VARs to use the Akaike or Schwarz information criterion (AIC or BIC) to choose the maximum lag length of the model.

second method with those from a PLL version of the univariate model. Dummies are included to address the global financial crisis for all the models.³³ The models forecast recursively, adding one observation at a time, and re-estimating the model each time from 1982 to generate the 12-month-ahead forecast from 2012:1³⁴ to 2017:3, with data up to March 2018. This gives 63 observations to compute the root mean squared forecast error (RMSE) for each methodology and each of the range of information sets.

The environment of low and fairly stable inflation during this period makes it particularly challenging to beat the benchmark model. Nevertheless, the finding is that the outperformance of US core inflation models with PLL restrictions applied to the widest of the information sets is broadly similar to the 2013 paper. As in that paper, model averaging improves forecast performance. The RSMEs of the best models using PLL are around 30-35 percent lower than the RMSE of the univariate BIC-selected benchmark inflation model. In almost all information sets there is a considerable loss of forecasting performance from using the BIC criterion applied to conventionally unrestricted lags as compared with the longer lags allowed with the PLL restriction. Clearly, the application of standard methods throws away a great deal of useful information for forecasting.

This has implications for the forecasting literature. Much effort has gone into dynamic factor models, which combine the information from many *variables* to improve forecasting performance, see Stock and Watson (2011). But little effort has been expended to assess the considerable information content of longer *lags*, which is regrettable in view of the potential forecasting gains. The combination of PLL with dynamic factors has considerable potential, in our view.

Having established the forecasting power of extended information sets with both long-run variables and lags up to two years, a parsimonious form of the model to aid the economic interpretation was sought using model selection following Doornik (2009).³⁵ The fit of the resulting model is shown in Figure 3.

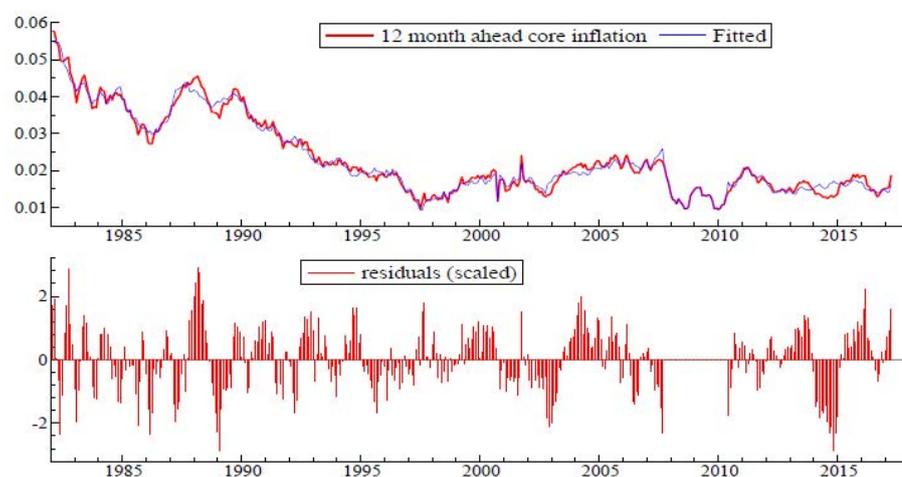
³³ Given a maximum lag of 24 months for the economic variables, impulse dummies for the global financial crisis period from 2008:9 to 2010:9 are included in all models. To forecast 12 months ahead, it is necessary also to include leads up to 12 months of the impulse dummies; together this is equivalent to omitting 36 months around the crisis period. In one information set, we also include a 2008:9 step dummy to allow for a possible step-change in the mean of the process (i.e. a permanent change, say in productivity).

³⁴ For example, the 12-month ahead forecast for 2012:1 uses parameters estimated up to 2011:1.

³⁵ The Doornik-Hendry Autometrics software, Doornik (2009), is an objective and easily reproducible tool for parsimonious model selection, not affected by the subjective choices of the modeller. Any other investigator with the same data and the same specification of the 'general unrestricted model' (GUM), will then make the same model selection, given the chosen settings in Autometrics. This software examines a full set of general to simple reduction paths to select a parsimonious form of the GUM to satisfy a set of test criteria. In our context, the overlapping nature of the dependent variable means that residuals will be auto-correlated and so the corresponding tests, including portmanteau tests, are switched off. Heteroscedasticity could be endemic: the corresponding tests are therefore switched off, but we use heteroscedasticity and autocorrelation corrected (HAC) t-ratios and F-tests of stability for model selection. This results in a considerable reduction in the number of parameters, and further reductions are possible, for example by combining two 3-month change variables at t and $t-3$ into a 6-month change at t .

Figure 3

Fitted vs actual values of the 12-month-ahead model of core inflation, and scaled residuals



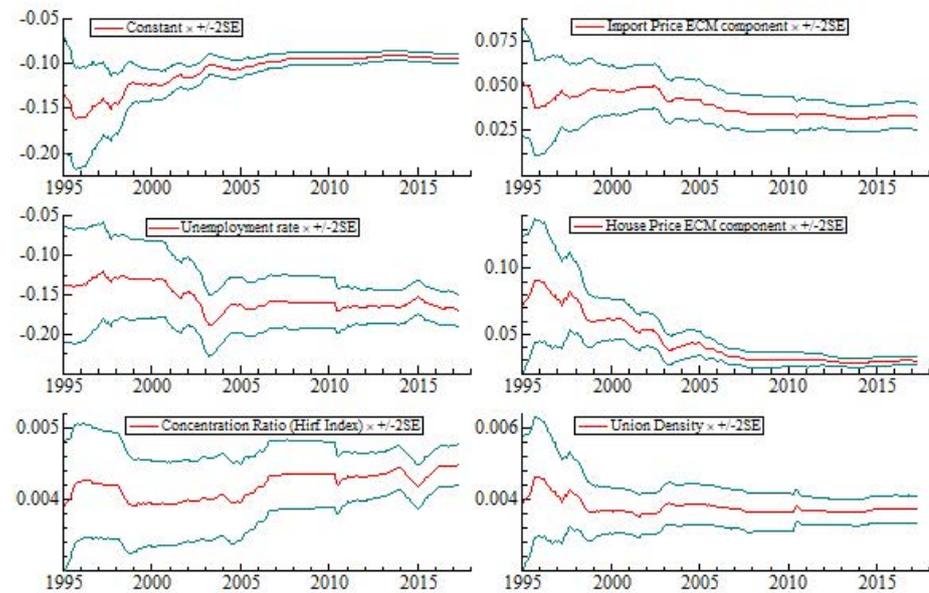
Source: Own estimations.

There is satisfactory stability of the long-run parameters over different samples, given the range of uncertainty provided by robust t-ratios. Figure 4 shows recursive estimates from 1994 to 2017 of the long-term elements. Reading from the top, left to right, the estimates are for the constant term, log (import prices/core index), the unemployment rate, log (house prices/core index), the concentration ratio and union density. The unemployment effect has a robust t-ratio of around -11 at the end of the sample. This constitutes impressive evidence that a version of the Phillips curve is alive and well.³⁶ When the data are taken back to 1977, although short-run dynamics are somewhat different, the coefficient on the unemployment rate is almost identical.

³⁶ This was also a conclusion reached by Gordon (2013) in a model including a stochastic trend, which might well be reflecting longer run forces such as the decline in trade union power.

Figure 4

Recursive parameter estimates of the long-run parameters in the core inflation forecasting model



Source: Own estimations.

Our evidence is that the marginal effect of the unemployment rate on inflation has NOT ‘flattened’ (fallen): rather, the intercept has shifted. However, it is likely that the marginal effect of the Federal Reserve’s policy rate on inflation HAS flattened, and shifted³⁷. Our research has established a link from monetary policy to inflation not only via labour market slack but via the exchange rate and house prices. But the latter links are complex and time-dependent and involve other major drivers such as credit liberalisation. For example, section 3 suggested the effect of user cost on house prices depends on time-varying levels of household leverage. Moreover, Duca et al (2011, 2016) estimate an important non-linearity in the effect of user costs so that at low levels, after significant capital gains, the marginal effect of the mortgage rate on house prices is greater, while the marginal effect is smaller after significant capital losses, for example in the 2007-2012 period. Furthermore, the linkage between the Federal Funds rate and the mortgage rate is also state dependent, with risk spreads dominating the effect of the policy rate in the 2007-2012 period. The US mortgage market, dominated by fixed rate mortgages, offers a cheap refinance option for those with adequate net equity. But in the house price collapse, after net equity evaporated, many were no longer able to refinance, which slowed the transmission of the policy rate to the effective mortgage rate available to households. These are three reasons why the monetary transmission to house prices was necessarily weaker and slower in the 2007-2012 period. This made it all the more important that credit easing and the use of FHA-underwritten mortgages to replace new private label mortgage backed securities, which had virtually ceased to be available, came to the rescue of the

³⁷ I am grateful to Ben Friedman for raising the contrasting questions.

system. Since our research on consumption also demonstrates an important time-varying effect of housing collateral on consumption, and hence on aggregate demand and labour market slack, these arguments suggest that conventional monetary policy was particularly ineffective in the 2007-2012 period in the US.³⁸

In the forecasting model above, part of inflation dynamics come from the adjustment of consumer prices, when the long-run drivers shift. The long-run equilibrium solution for the log core consumption deflator is a linear combination of the log import price index and the log house price index, with the unemployment rate and union density mainly proxying log unit labour costs and the concentration index best interpreted as part of the mark-up between consumer prices and costs of production.³⁹ Figure 5 plots the log consumption deflator minus the weighted average of log import prices and log house prices against the other longer run components of the solution: the unemployment rate, union density and firm concentration.⁴⁰ If union density and firm concentration stabilise, some upward pressure on the *relative* consumption deflator should be emerging from the lower unemployment rate. Onto the consumption deflator itself, as of 2018, there should be a feed-through still to come from higher house prices, and for import prices, a battle between higher tariffs increasing prices and an appreciating exchange rate lowering prices.

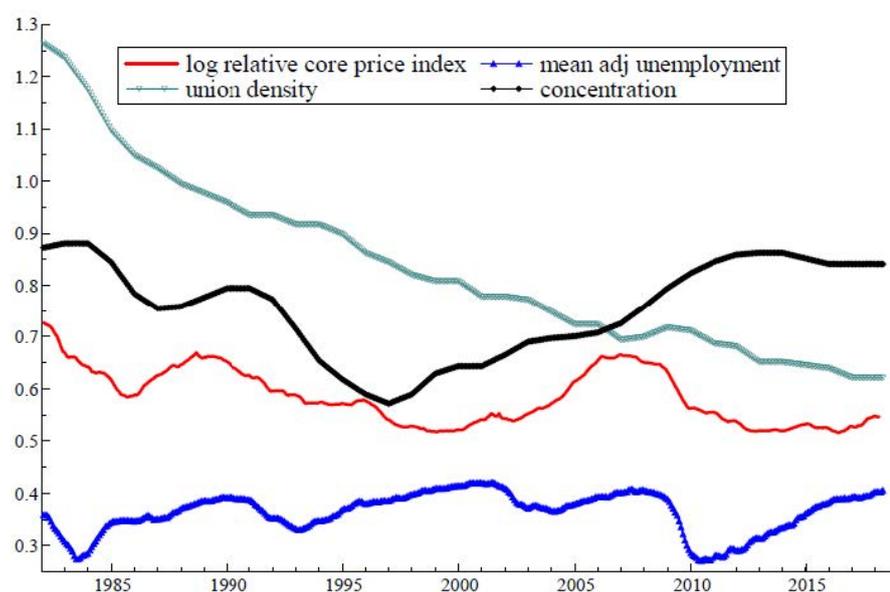
³⁸ As noted in section 2, this diagnosis and the policy solutions could not have been suggested by the New Keynesian DSGE models. In contrast, the household sector models discussed in section 3, incorporating time-varying credit conditions, can explain such time variations in monetary policy effectiveness. Embedding them in larger models to more fully capture the feedback loops is necessary.

³⁹ This does not exclude the possibility that, in this reduced form forecasting model, the unemployment rate might also affect the mark-up and that the concentration ratio might also proxy monopsony power of firms in the labour market, so affecting unit labour costs.

⁴⁰ For example the concentration effect is the Herfindahl concentration index times the end-sample value of its coefficient plotted in Figure 4, divided by the sum of the end-sample coefficients on log import prices and log house prices.

Figure 5

Long-run contributions to the log relative core price index of the unemployment rate, union density and firm concentration



Source: Own estimations.

The three longer run drivers shown in Figure 5 do *not* add up to the relative consumption deflator because of lagged adjustment and because of other complex, lagged inflation dynamics, the reasons for which were discussed above. One of the intriguing findings on these dynamics is the *negative* effect of core inflation in the current and previous year on the next year's core inflation, given equilibrium correction and conventionally signed effects of recent growth of earnings, import prices, other foreign prices and the exchange rate. One interpretation of this finding is as part of an anti-inflation feedback rule of the Federal Reserve, tightening policy in response to recently higher core inflation. But it is also possible that businesses, where prices have increased more than in potentially competitive sectors, find themselves losing market share and so are forced to price more moderately. Note that this negative feedback is additional to that already represented through the equilibrium correction terms based on relative prices. These finding puts an entirely different perspective on the apparent persistence of inflation implied by naïve univariate forecasting models.

Farmer and Nicolo (2018) propose a Keynesian model *without* the Phillips curve. They argue: "Central bankers use the concept of a time-varying natural rate of unemployment before deciding when and if to raise the nominal interest rate. The difficulty of estimating the natural rate arises, in practice, because the economy displays no tendency to return to its natural rate. That fact has led to much recent skepticism about the usefulness of the Phillips curve in policy analysis." While they are surely right to want to abolish the *conventional* New Keynesian Phillips Curve, there is nevertheless strong evidence, see above, that unemployment has an important effect

on the core consumption deflator and hence on core inflation, *provided the right controls, including long-run variables and at long enough lags, are included.*⁴¹ Thus, a broader and more economically satisfactory concept of the Phillips Curve could be resurrected which we could christen ‘the Sargan-Phillips Curve’, as Sargan (1964) was the first to emphasise the role of equilibrium correction in the inflation context. In other words, he was the first to formalise the idea that part of the inflation process is dynamic adjustment of relative prices as explained above. Further powerful long-run evidence for this view for the UK is provided by Hendry (2001).

The results of Aron and Muellbauer (2013, 2018) for models of US PCE and the core consumption deflator, and in Hendry (2001) for the UK GDP deflator, throw serious doubt on the usefulness of the NAIRU concept. The empirical results strongly contradict the accelerationist view of inflation. As noted above, there is a tendency for high annual rates of inflation in the US to be followed by *lower* inflation a year later, given the other controls. One could define a kind of ‘natural rate of unemployment’ as the rate consistent with say 2 percent inflation. However, as our results interpret a substantial part of inflation as being the process of adjustment of the price level towards a long-run level dependent on several other factors as well as the unemployment rate, it is wrong to focus narrowly on the unemployment rate. Of the long-run relative price variables, import prices or the real exchange rate and the level of house prices are also potentially responsive to monetary policy. Moreover, the level of concentration among public companies, and union density, are potentially affected by regulatory policies. For policy analysis, therefore, it is far better to embed a comprehensive inflation model, embodying these more general drivers of inflation and their longer lags, into an econometric model in which alternative policy options can be dynamically simulated. Constâncio (2018), reviewing some of the empirical evidence against the New Keynesian Phillips Curve, also expresses severe scepticism about the usefulness of the NAIRU and natural rate concepts.

5 Forecasting per capita household income and GDP for France

A further example of how Parsimonious Longer Lags can improve forecasts is provided by models of real GDP and of household income. Aron and Muellbauer (2002) used the PLL tool to develop a forecasting model for real GDP in South Africa, where multiple regime shifts also had to be taken into account.⁴² For the consumption function, as noted in section 3, it is important to incorporate permanent income, capturing income growth expectations. This permits the separation of effects on consumption of current income from longer-term expectations. Since the stock market turns out to have predictive power for permanent income, the pure wealth effect can be separated from the income expectations effect. The NK-DSGE model assumed, by the omission of equity prices and balance sheets, that equity prices are a side-show,

⁴¹ The models in Aron and Muellbauer (2013, 2018) with the widest information sets also include the short-term dynamics of hourly earnings in the US. As these are also affected by unemployment, the net effect is even larger than indicated above.

⁴² In turn, this built on insights developed for forecasting annual real GDP for the US in Muellbauer (1996).

merely reflecting income growth expectations. Instead, we find significant illiquid financial wealth effects in every country studied even after controlling for permanent income.

Chauvin and Muellbauer (2018) develop a model for forecasting permanent real per capita household income assuming a 5% per quarter discount rate over a 10-year horizon. The FRB-US model assumes a similarly high discount rate, which is broadly consistent with the insights of the buffer-stock models of household saving, averaging over households. In a quarterly consumption function, the weight for France is around 0.55 for log permanent income and 0.45 for log current income, given controls including asset to income ratios and credit conditions. This is consistent with a spate of micro-evidence on the effects, for example, of temporary tax cuts or income tax credits, though of course, there is a great deal of heterogeneity at the micro level.

The forecasting model includes a rich set of determinants, using 4-quarter moving averages to parsimoniously capture longer lags. The economic variables with a negative effect on the log permanent real per capita income include changes in nominal, and levels of real interest rates, current log real per capita income because of trend reversion, the unemployment rate (because it weakens the power of workers in wage negotiations and hence their share of national income), log real oil prices and the log real exchange rate, indicating worsening competitiveness. The real oil price, the real interest rate and the real exchange rate have particularly persistent effects on the ratio of permanent to current income, possibly reflecting their impact on investment and innovation, but perhaps also on the wage bargaining power of workers. The long lags may be partly the result of the high degree of state intervention in France, e.g. in social benefits, to stabilise household incomes. This is likely to slow the speed at which shocks are transmitted to income.

Variables with a positive effect include a survey measure of short-term household expectations, recent changes in log real per capita income, possibly indicating some growth momentum, the log stock market index in real terms (it indicates expectations of productivity growth and is one of the drivers of capital investment which expands future capacity), and finally the ratio of the working age population divided by the total population. Its future decline is likely to limit per capita income growth.

One cannot literally interpret such a complex model in terms of households having information on all the variables included. However, the media environment is one in which economic prospects and many expert views, for example, from the OECD, the IMF and financial commentators, are widely discussed. The negative effects on income prospects of high real oil prices, high real interest rates and an uncompetitive exchange rate are widely understood by experts. Arguably such a model represents a maximally 'rational' interpretation of household income expectations, given a world subject to evolution and structural breaks.

Linear trends are included, including one in the late 1970s and one beginning with the financial crisis. However, households cannot possibly have foreseen the financial crisis. Hence for a model like this, which builds in the ex-post effects of the crisis, to have a chance of representing their expectations, it is necessary to remove, before the crisis occurred, the effect of the downshift in the crisis of the linear trend from the

generated permanent income measure used to model consumption and house prices. We then assume a gradual, two-year process of learning, in which households absorb information about the downshift in trend growth.

In a parallel model to forecast French per capita real GDP one and two years ahead, similar variables are relevant, with the exception of the unemployment rate. The lags are long and application of the Bayesian information criterion to the standard unrestricted lag structure as used in VARs, results in a drastic deterioration in fit and forecasting performance. However, lags are typically not quite as long as for equivalent one and two-year ahead household income equations, and real GDP per capita is considerably more volatile and harder to forecast. This is consistent with the stabilising role for household income of the state in France discussed above.

6 Conclusions

This paper has provided argument and macroeconomic evidence from diverse research in favour of the relevance of the ‘information economics revolution’ to which Joseph Stiglitz made such important contributions. A strong implication is that credit constraints are a ubiquitous feature of the macro economy. It then follows, that given the post-war transformations of banking and credit institutions, *shifts* in access to credit need to be taken into account in building macroeconomic models. This is an insight that was widely ignored not only in the New Keynesian DSGE literature but is still neglected in the large non-DSGE macro-econometric models used at many central banks.

Financial stability continues to be a major issue for central banks and better macro-models are needed in order to understand the feedback mechanisms that can amplify shocks and lead to financial instability. Systems of equations that my co-authors and I have been developing for the household sector, including consumption, portfolio composition and house prices, do take shifting credit constraints into account. Often, it is impossible to obtain coherent models of consumption, house prices and mortgage debt without such shifts. These models highlight institutional differences between countries and over time, helping to understand why some are much more prone to amplifying feedbacks that reduce financial stability. Macro models incorporating these new models of the household sector would be a useful complement to stress-testing and micro-evidence on household vulnerabilities to enhance the application, where necessary of macro-prudential tools.

The information economics revolution supports Stiglitz’s crucial insight that path dependence is a key to understanding the evolution of the macro-economy.⁴³ The evolutionary nature of economic processes and the highly limited ability of agents to foresee the future suggests the macro-economic profession needs to take account of the information embedded in far longer lags than is conventional.

⁴³ Durlauf (1991) has highlighted some of the specific mechanisms by which path dependence influences GDP.

The fashions in macroeconomics, with DSGE models on the one hand, and Bayesian-VAR models on the other, have led to economists paying *far too little attention* to the long-run. As a result, they have not been able to learn fully the lessons buried in macroeconomic data. This refers both to mis-specification through the omission of variables that reflect long-run relationships and the omission of sufficiently long lags. One example concerns the difficult issues of identifying empirically the slowly evolving influence of demography on income growth, household saving behaviour and potentially on future real interest rates. The household systems approach discussed above, applied to long samples of data and more than one country, promises to help resolve these difficulties.

Many economists understand the concept of cointegration of non-stationary data and the importance of the long-run relationships. This is not a new point. But in the context of inflation modelling and forecasting, it is too often neglected, as the vast majority of models are structured in the differenced mode, without long-run variables such as relative prices, despite the classic paper by Sargan (1964).

The simple ‘Parsimonious Longer Lag’ tool combined with the model selection and forecasting insights that David Hendry has developed over many years, promise significant future improvements in learning from data when modelling and forecasting the macro-economy. Evidence has been provided that the application of these tools greatly improves the understanding and forecasting of US inflation and of fluctuations in household income and GDP in France.

We find that while the link from unemployment to inflation has not become flatter, that between the US policy rate and US inflation *has* become flatter, with conventional policy particularly ineffective in the 2009-2012 period. These findings are consistent with a more general point made by Constâncio (2017c). He asks whether the balance sheet measures adopted by major central banks during the financial crisis should remain permanent parts of the central bank toolkit. He says: “there are good arguments to preserve the instrument in the policy toolkit. They stem from structural changes that have occurred in financial markets.” To those changes mentioned by Constâncio, one should add the massive shift by banks to real estate collateral backed lending, tracked by Jorda et al (2016), and the rise in leverage discussed in section 3, which new financial regulations have far from fully reversed.

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Discussion on “The future of macroeconomics” by John Muellbauer

By Roger E. A. Farmer¹

I'd like to echo John's thoughts about Vitor and to thank Vitor for including me in this conference. Like John I've had many discussions with Vitor in which I would turn up in his office at 4 o'clock for a 15-minute discussion and after an hour and a half we'd still be talking about economics. If I'd known that we could also have had a discussion about music I'm sure we would still be there now.

Let me start out by saying that, in a 10-minute discussion it's difficult to do justice to everything that's in John's very interesting paper. I'm going to draw on what I take to be three themes. The first theme, that John did not say a huge amount about, is that clearly some of the DSGE models we've been working with have not been particularly successful.

Secondly, John mentioned a couple of people that he's found very insightful. One is David Hendry and one is Joe Stiglitz and I echo that sentiment. In my first job at the University of Toronto I went to see Joe Stiglitz give a talk. At the time, I didn't really have a clear thesis topic.

My thesis ended up being inspired by that talk; so the notion that there are some very important insights in what we call the information revolution in economics is one that I endorse wholeheartedly.

Finally, one of the things I'd like to talk about in this discussion is what we can learn from the information revolution. My view is that what we can learn is perhaps even a little more radical than some of the things that John drew attention to.

John provided some insights from his own empirical work and I'm going to complement those insights. I will agree with some of them and provide what I believe are some important ideas, particularly for policymaking, when we think about the relationship between inflation and unemployment. There are a few themes that I'll talk about. The first one, that I've alluded to already, is exactly how we should think about introducing information theory into macroeconomics.

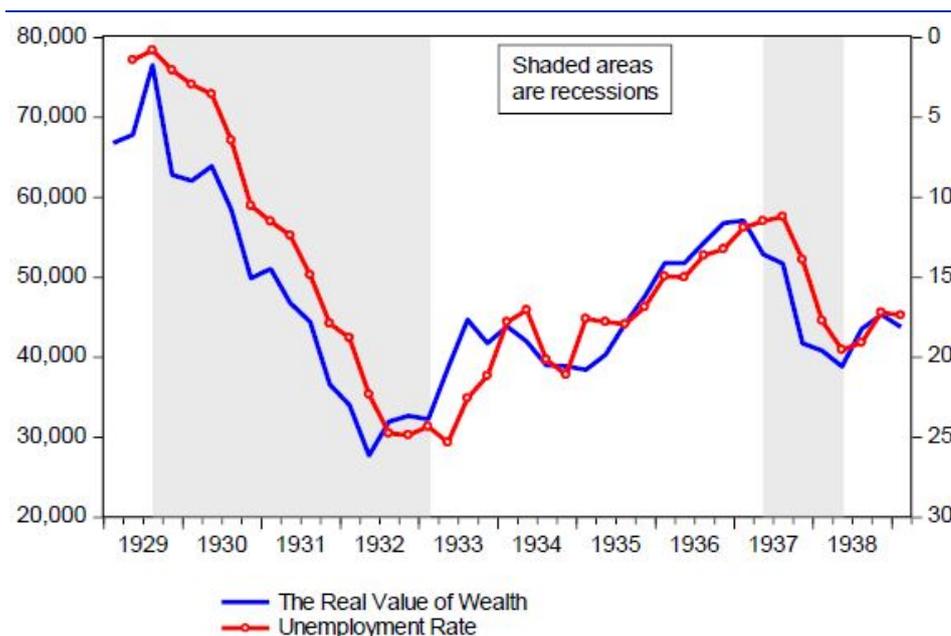
I believe that there are two ways in which information theory is important. One is connected with the asset markets and the other is connected with the labour market. My view is that the lessons we should be taking away from information theory go a great deal beyond the idea that shocks become amplified. In my own work, I've gone back to take what I consider to be an important idea that was in Keynes's General Theory and which became forgotten: Market economies are not self-correcting. We may get stuck with unemployment rates which could be 20% for decades or 5% for

¹ University of Warwick, NIESR and UCLA.

decades. The way we ought to think about that in the language of modern general equilibrium theory is that there are not just multiple equilibria; there is, potentially, a continuum of equilibria.

If you run with that idea it leads you to think about the progress we've made in the empirics of Phillips curves. I'm going to make the argument that there's a really important question that follows from the fact that there is a huge amount of persistence in the unemployment rate. In fact, I'll show you evidence which suggests that it's difficult to distinguish innovations to the unemployment rate in the U.S. from a random walk. The question then becomes, is persistence of the unemployment rate caused by supply-side factors or is it caused by demand-side factors? According to the supply side view, the natural rate of unemployment is moving around. According to the demand-side view, the actual unemployment rate is moving around in a set of possible multiple equilibria and the natural rate of unemployment, as usually defined, is a meaningless concept. If this second view is correct, there is the potential for monetary policy not just to get us back to the natural rate of unemployment more quickly but to permanently influence the steady state unemployment rate.

Chart 1
Unemployment and Wealth During the Great Depression

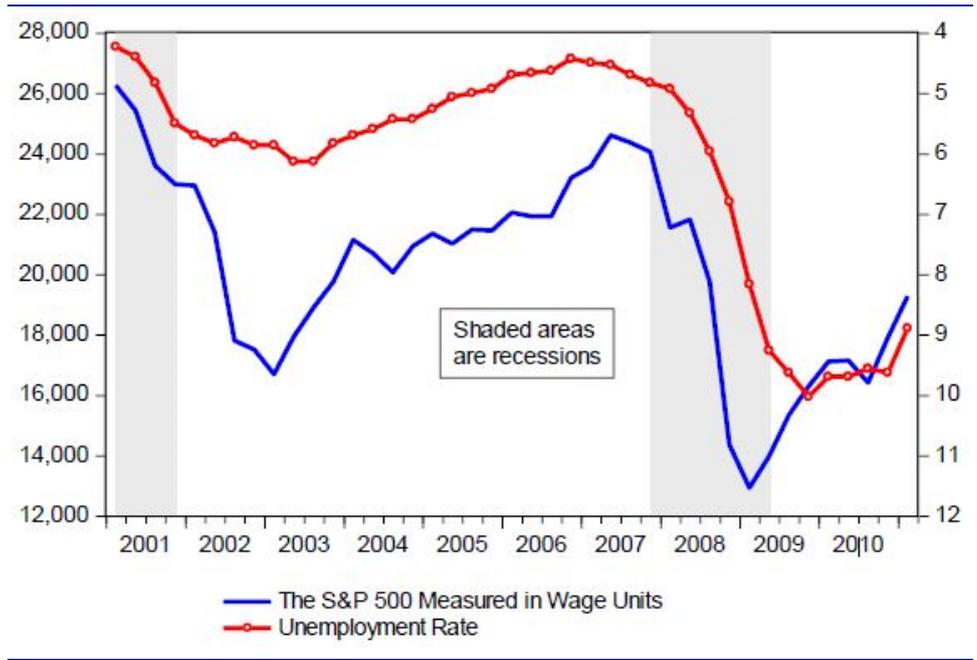


Source: FRED II and author's calculations.

I'm going to show you some evidence here from my own work on the connection between financial markets and labour markets. In Chart 1, the solid line is a measure of the real value of stock market wealth in the 1920s in the United States. The line marked with circles is the unemployment rate. This is measured on the right axis on an inverted scale that varies between 0 percent and 30 percent. Notice that movements in the asset markets precede movements in the unemployment rate. This chart is suggestive that there is a causal connection that runs from asset prices to the labour market.

Now let's examine some more recent data. Chart 2 shows what happened in the Great Recession. This picture is similar to Chart 1 although the magnitudes are not as great. The right scale runs from 4 percent to 12 percent rather than from 0 to 30 percent. However, the notion of a causal mechanism between falls in wealth and increases in unemployment is, I think, a relatively easy one to take away from these charts.

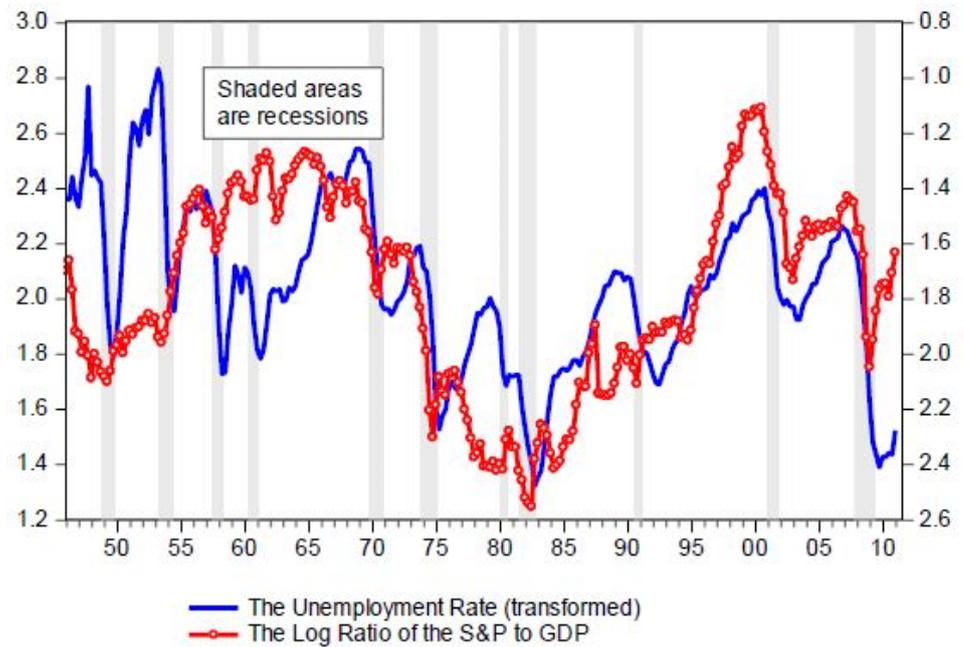
Chart 2
Unemployment and Wealth During the Great Depression



Source: FRED II and author's calculations.

Chart 3

Unemployment and the Stock Market in Post-WWII Data

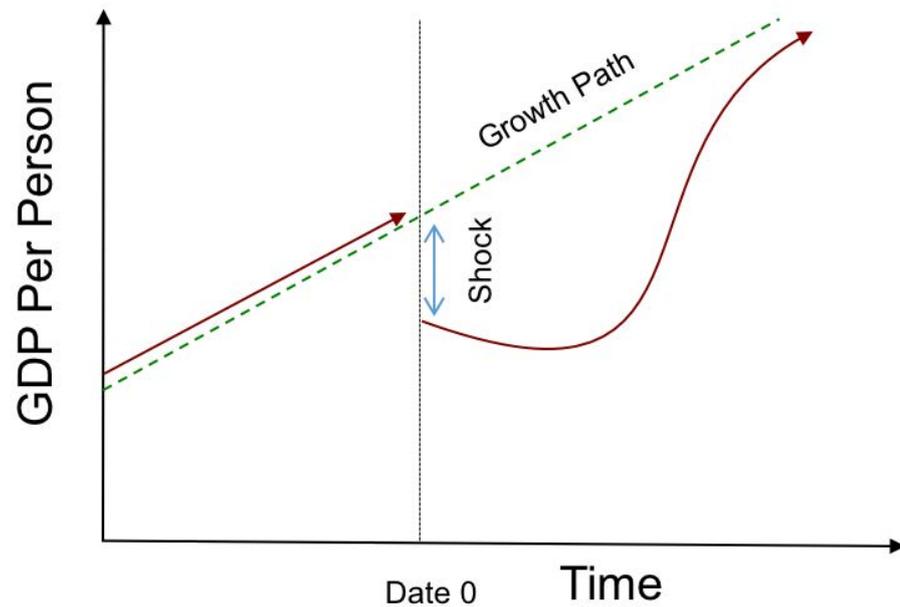


Source: FRED II and author's calculations.

One might believe that these two historical periods are special. But that is not the case. Chart 3 illustrates data from 1945 up through 2011 showing the connection between unemployment and the stock market. The stock market is measured as the logarithm of a real measure of the S&P 500 index. The transformed unemployment rate is measured as a logistic transformation of the logarithm of the reported unemployment rate. I chose these transformations to ensure that both variables can vary between minus infinity and plus infinity. A careful analysis of the properties of these variables reveals that they are each well modelled individually as random walks.² But a linear combination of the unemployment rate and the stock market is a stationary variable. Technically, we say that they are cointegrated. Further, the cointegrating relationship between unemployment and the stock market has been quite stable over the entire post-war period.

² More precisely, they each have a non-stationary I(1) component. See Hamilton (1994) for a discussion of this concept and of the related concept of cointegration.

Chart 4
The Rocking Horse Model



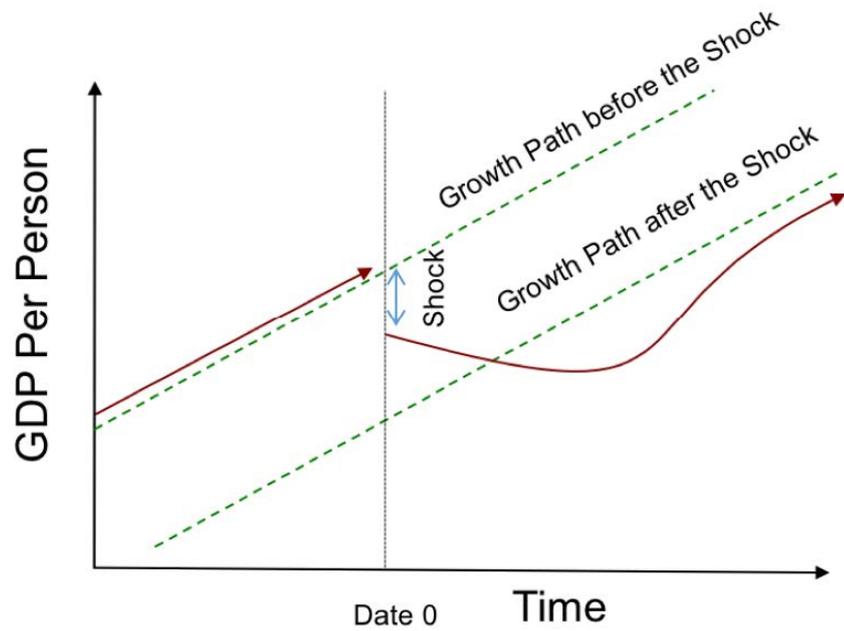
Source: *Prosperity for All*. Figure 8.3. Used by permission.

In my view, the connection between the stock market and the unemployment rate is causal and it operates through a demand-side mechanism and not a supply-side mechanism.

Next I'm going to show you some toy models to help you think about what that statement entails. The first model, I call this a rocking horse model, is the kind that characterizes *almost all* of modern DSG theory. The rocking horse model is illustrated in Chart 4. This model has the property that, after a shock, the economy returns back to its growth path. The dynamics of a rocking horse model is well described by a vector autoregression in which there is a stable point or a stable growth path to which the economy returns.

Chart 5 illustrates an alternative theory that I call the windy boat model. In the windy boat model, the economy is like a boat on the ocean with a broken rudder. The dynamics of the windy boat model can be described by a process that physicists call *hysteresis*. If there is a shock to the economy, instead of returning back to the same growth path, the economy returns back to a different growth path as in the illustration in Chart 5.

Chart 5
The Windy Boat Model

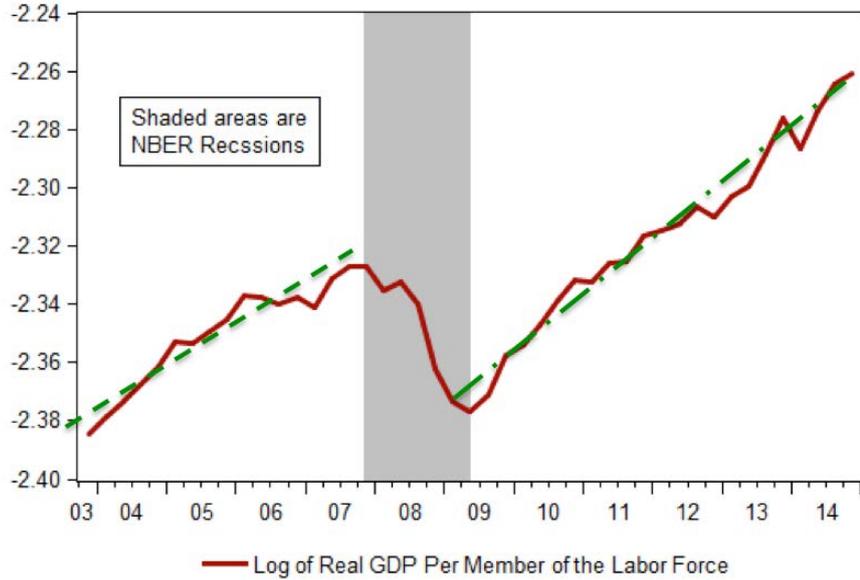


Source: *Prosperity for All*: Figure 8.3. Used by permission.

The interesting question is: Is the economy more like the rocking horse or is it more like the windy boat? In the windy boat example, instead of there being a point that the economy returns to there is a connected set of points. There are many steady-state equilibrium unemployment rates, any one of which could act as a rest point for the system.

Chart 6

U.S. Data Since the Great Recession

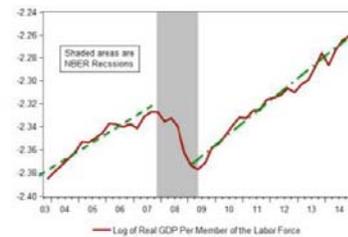
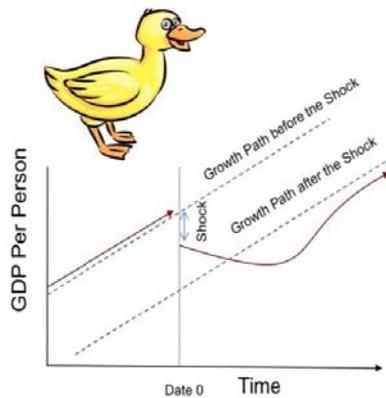


Source: *Prosperity for All*, Figure 8.5. Used by permission.

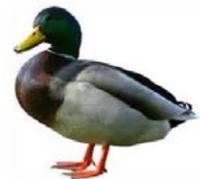
Chart 7

Comparing models with data

If it Looks Like Duck....



...swims like a duck and quacks like a duck...



Source: *Prosperity for All*, presentation slide.

Chart 6 illustrates what happened in the U.S. data after the Great Recession. This picture, in my view, is a lot closer to my windy boat model than to the rocking horse model. There is a saying that I learned in the United States which I have illustrated in Chart 7. If it looks like a duck, swims like a duck and quacks like a duck; it probably is a duck.

The conclusions I take away from this discussion are twofold. First, there is a great deal wrong with the DSGE models we've been using for the past fifty years and, second, we can learn from the information revolution. But the kinds of things we need to learn from the information revolution are likely to have more profound effects than the simple tweaks that too many New Keynesian economists continue to make to New Keynesian DSGE models. The economy is not a stable self-correcting system: It is characterized by instability and hysteresis. These conclusions lead to a key question and this is where John's work on the dynamics of unemployment and inflation come in.

I personally am quite critical of Phillips curves. I have long argued that they haven't existed in data since Phillips wrote the first paper on the topic in 1958. On the other side of this argument, there are people like Bob Gordon (2013) who has argued that the Phillips curve is alive and well and that it is possible to estimate a stable Phillips curve in post-WWII data. But the way that Bob does this is by assuming that the natural rate of unemployment itself is a random walk. Like the hysteresis view, this assumption also implies that the unemployment rate has a non-stationary component. But when non-stationarity comes from supply-side shifts in the supply of labour, there is not much that policy can, or should, do to correct the situation. I'm not sure where John stands on this issue; but in my view it is one of the most important issues for the future of macroeconomics.

The question we need to ask ourselves is this: Is the non-stationary component of the unemployment rate due to a non-stationary component of the structure of labour markets that causes changes in the natural rate of unemployment to move in unpredictable ways? Or, is it due to demand side variables that we can potentially influence through monetary policy? These two explanations have very different consequences for the way economists and policy makers should think about operationalizing not just monetary policy, but also fiscal policy going forwards.

To conclude, I enjoyed reading John's paper enormously and, in this discussion, I've provided some complementary ideas that I have elaborated on in more depth in my recent book, *Prosperity for All: How to Prevent Financial Crises*.

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The future of money and of monetary policy

By C. Goodhart¹

Introduction

It has been a great honour to be asked by Vítor Constâncio, whom I greatly admire, to prepare a paper on this subject. But my credentials for this role are thin. At my age, the past looms larger than the future. Moreover, my forecasting skills are weak. In my forecast world, Hillary Clinton would have been President, and the UK would still be a member of the EU. Beyond that, much in the future will depend on technological change, particularly within the digital and electronic fields; but I am one of the last of the pre-electronic world. When I went to Cambridge University in the 1950s, there was only one computer in the whole of the University, housed in an extremely large room with thousands of valves connected by a spaghetti-junction of wires. When dealing with a new electronic gadget, I have to ask my grandchildren how to work it.

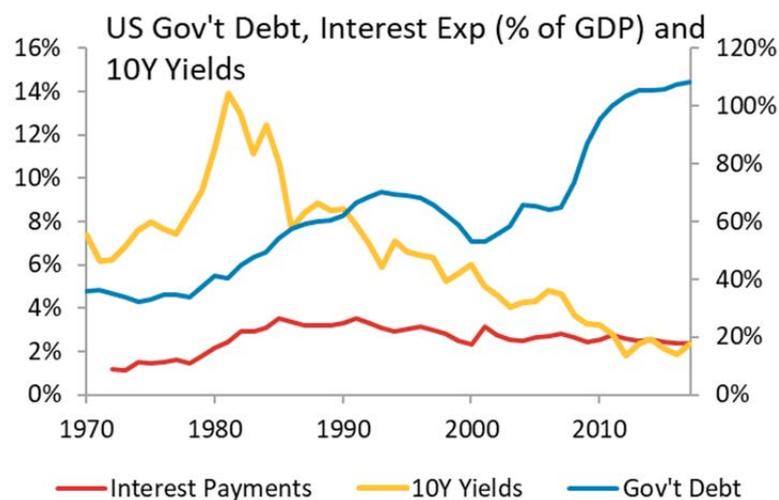
1 Recent Developments

Nevertheless, let me set the scene. Underlying trends have been favourable for Central Banks and their operational independence in recent decades. Interest rates, both nominal and real, have trended down over the last thirty years. As a result, although debt ratios for most countries and most sectors have been rising, with the exception of banks since 2009 and Germany, debt service ratios have remained low and steady, as shown in Figures 1 and 2.

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Figure 1

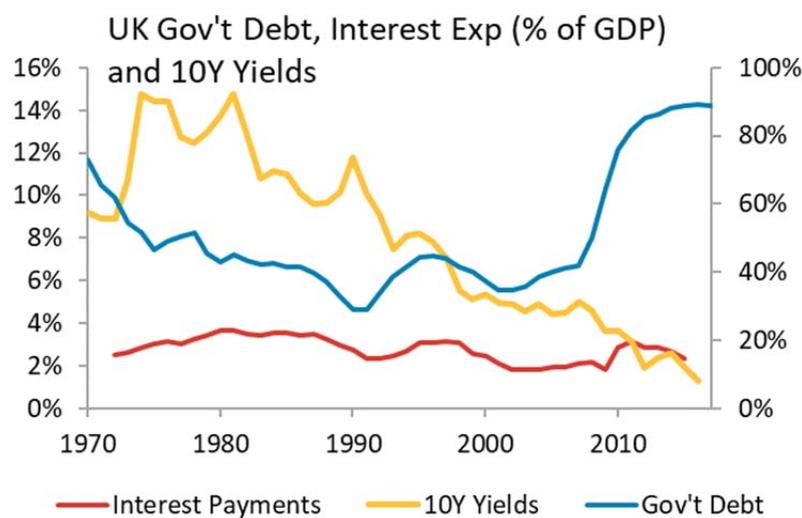
US Gov't Debt, Interest Exp (% of GDP) and 10Y Yields



Source: National sources, IMF, WB.

Figure 2

UK Gov't Debt, Interest Exp (% of GDP) and 10Y Yields



Source: National sources, IMF, WB.

While these two figures show data for the US and the UK, much the same has been the case for other developed economies, notably in Europe.

Borrowers, especially public sectors and non-financial corporates, have gained. Those already holding assets, notably the old and the rich, have benefited. The losers have been savers who do not have initial assets, in particular the young and the poor, but these have tended to blame governments for their disadvantages, not so much Central Banks.

The basic reason for the declining interest rates has been strong deflationary headwinds. These have been largely due to a combination of demographic factors and the entry into the global trading system of China and Eastern Europe, the latter after the breakup of the Soviet Union. The demographic factors include the passage of the post-war baby boom through the labour market, moving towards retirement. This led both to an increase in the labour supply and a temporary sharp improvement in the dependency ratio, as the proportion of young within the population declined faster than the rise in the number of aged retirees.

The effective labour supply more than doubled since about 1990, the greatest positive labour supply shock ever recorded. The effect of this on the returns to the various factors of production were natural and straightforward. The return to unskilled labour within each country declined quite sharply, whereas the return to management, capital and highly-skilled labour increased sharply. Amidst the twin pincers of potential offshoring and competitive immigration, labour market power declined drastically. John Muellbauer, in his accompanying paper, reported the steady decline in trade union density. Why did this occur? Because in this context of globalisation and plentiful labour, management had the whip hand.

2 Future Reversal of Trends

But such demographic trends are likely to reverse sharply, as the growth of the labour force slows, and in many countries, including many in Europe, such as Germany, actually declines. Moreover, China has reached the Lewis point, when the potential source of additional labour via migration from the inland western provinces to eastern coast manufacturing draws to a close. Indeed, China's labour force having risen sharply is now set to decline, as rapidly as that in Japan. Not surprisingly, Chinese workers have been saving voraciously. Although a communist country, China does not have much of a welfare safety net. The one-child policy has meant that four grandparents share one grandchild, so the family safety net has also collapsed; and their expectation of life has risen sharply. No wonder the Chinese savings ratio has been so high. While this is, perhaps, an extreme example, much the same has been going on in many other similar countries, both developed and emerging.

One of the most fundamental questions facing the world is whether the Indian sub-continent and Africa, where the demographic outlook is quite different, can take China's place, as the future workshops of the world. This latter, however, is too large, too difficult and general subject for me to address in this short space.

But the macroeconomic headwinds of recent decades not only come from a 'savings glut' from the personal sector, but also from the fact that non-financial corporate investment has been remarkably low. Indeed, the corporate sector has shifted dramatically from its historical role as a net deficit sector to having a net surplus. With both the corporate and personal sectors piling up large surpluses, the counterpart in the world has had to be an increase in public sector deficits. Though the balance between countries is, of course, dependent on their current account balance.

What determines this net surplus of the corporate sector? One of the reasons has been the overall slow growth of output and demand itself. But in the context of extraordinarily low interest rates, and high profitability, one might nevertheless have expected much more corporate investment. There are several reasons that have been put forward to explain such weakness in investment; far from being mutually exclusive, all of the following factors may have played some role in this development, though how one may weight their respective influences, is too difficult for me to ascertain.

Technology

Perhaps the best known is the claim by Robert Gordon that all the easiest and simplest technical inventions have already been exploited. Besides his well-known book on *The Rise and Fall of American Growth*, (2016), I have recently read his latest excellent NBER Working Paper on 'Why has economic growth slowed when innovation appears to be accelerating?', (2018). It may also be true that the new kind of innovation in electronic/digital technology involves more reliance on human capital, and less expenditure on 'real' resources than in the past.

Monopoly

A second reason that has been put forward involves a suggestion that production has become concentrated among a smaller number of monopolistic firms. Again, in his earlier paper, John Muellbauer referred to the concept of an increasing concentration ratio.

Managerial incentives

Yet another line of argument is that the incentives of managers of public companies have become increasingly distorted towards raising short-term equity returns, both for shareholders in general and for themselves via the bonus culture in particular. In a world of exceptionally cheap debt, the easiest way to do this is to borrow and use the funds to buy back equity, thereby raising the leverage ratio, and shifting risk from themselves and their shareholders to creditors and other stakeholders more widely. My friend Andrew Smithers has written persuasively on this subject, See Smithers (2013).

Cheap labour

My own preferred explanation, however, reverts to the positive labour supply shock, making labour so extraordinarily plentiful and cheap. If labour is so cheap, there is no need for investment, or managerial effort, to raise competitiveness and productivity, in order to maintain profitability. Why undertake risky and tiresome exercises at a time when profitability remains so easy to attain?

But, as noted earlier, this latter effect is now starting to reverse in many, perhaps most, countries, and will do so increasingly. As the availability of labour (except in India and Africa) becomes increasingly tight, the pressures driving down inflation will reverse at some stage. Labour power has been so bashed by the context of the last few decades that the natural rate of unemployment has likely declined. But there is a limit to that, and eventually the Phillips curve will come into its own again. As inflation increases, monetary policy will normalise.

Central Banks will no longer be the best friends of borrowers, notably amongst those Ministers of Finance. How will politicians react, especially populist politicians, as Central Banks start to become more restrictive, rather than the only expansionary 'game in town'. In view of the increasing claims on the public purse of the growing army of the aged, with their needs for medical help, the fiscal outlook looks grim. If populist politicians allow fiscal expansion, how will they react to Central Banks stepping on the brakes of a 'people's car' which they want to accelerate faster? There are reasons to believe that the glory years of Central Bank independence are in the past, not the future.

And how will Central Banks handle the insolvencies in corporates and some over-levered households, as interest rates start to rise back up. The figures for debt ratios are so extreme that it is difficult to believe that Central Banks could apply either a rapid, or any extensive, rise in nominal interest rates without running into the danger of insolvency crises.

Have Central Bankers got themselves into a 'debt trap'? Given the context of the Great Financial Crisis (GFC), it was both right and inevitable that Central Banks would continue to lower interest to the Zero Lower Bound and hold them there. But this had the effect, indeed the intended effect, of encouraging further expansions of debt. Although the GFC was perceived as a financial crisis due to excessive leverage, especially in banks, the medication applied has had the effect of encouraging debt ratios, aside from banks, to rise sharply thereafter. We may have reached a point where debt ratios are so high that interest rates have to be kept at historically extremely low levels, thereby encouraging even more accumulation of further debt.

How can we get out of this debt trap?

Growth

Unfortunately the demographic forces outlined earlier will prevent this, even if productivity should recover. The growth of labour forces in many of our countries will start to decline. In Japan, the labour force over the last decade has been declining at about 1% per annum; but real growth has been rising at about 1% also. So output per worker has been growing at a rate of about 2% per year. This latter is far better than in most other developed economies. We will be very fortunate if we can match the experience of Japan in future decades. Demography probably means that we cannot expect real growth to be more than about 1.5% per annum over future decades.

Cancel debt

It so happened that the conference when this paper was presented occurred at the same time as the two Italian parties, the Northern League and the Five Star Movement, were trying to agree a program. Initially one of their proposals was that the Italian debt now held by the European Central Bank be cancelled. Indeed, quite a number of voices have argued that, since we owe the debt largely to ourselves, why do we not just cancel it? Indeed, that did take place in some of the earliest historical societies, such as in Babylonia and Sumeria. I had considerable pleasure in joining up with an economic historian specialising in such early antiquarian history, Michael Hudson, to prepare a paper outlining how the early Debt Jubilees worked, whereby the debt owed largely to the royal family by the working peasant population was cancelled; and then to explain why, in my view, a similar exercise could not be undertaken under the changed societal structure that we have today, but that other alternative mechanisms might be found to reach the same objective. It would take far too long to explain all this again now, but it can be found in our joint 2018 paper on Debt Jubilees.

Inflation

For the reasons already set out, in my view, the underlying fundamental forces tending towards deflation, will be replaced by similar forces leading to more inflationary pressures. Also see Juselius and Takats (2018). And the rise of populism, whose appeal has been largely based on the dismal returns to the bottom 50% of our working population, will spur that on further. There are already comments to be heard differentiating between 'good inflation' and 'bad inflation'.

The call to raise the inflation target in recent years always seemed odd, given that Central Banks have had such difficulty in hitting even the lower 2% target, and the loss of credibility that such a change in targetry would entail. But as inflationary pressures recur again, perhaps the simplest way out for politicians, at least in those cases where the legislature can control the Central Bank (not the ECB), would be simply to raise the target in line with such enhanced pressures. Only in the case of the ECB is Central Bank independence protected by treaty. Elsewhere the popular 'will of the people' may prevail, rightly or wrongly.

Default

Of course, unforeseen inflation is a form of default. Only in such cases where foreigners hold a large proportion of debt is default likely. Let us hope that it does not become too common.

Debt restructuring

Otherwise known as 'extend and pretend', this is likely to be increasingly employed, but it is a palliative, and limited in effect.

Switch to equity finance

This would be my preferred solution. It would involve manifold legal and structural changes, notably to eliminate or even reverse, the fiscal advantages of debt over equity finance, it would probably entail an accompanying series of reforms to corporate governance and to the way that corporate information is now publicly provided, i.e. the auditing process. But, again, this is too large a subject to be addressed here, though I hope to expand on it in future work.

3 Money, Debt and Information

Why do we use debt as the basis of money creation? In particular, debt has important informational advantages. There is no need to know the details of the borrower's condition, as long as payment is regularly made. Moreover, debt repayment is supported by the surrender of collateral and bankruptcy penalties. This contrasts with the relative opacity of equity control over the residual profitability of an enterprise. However, debt finance has numerous disadvantages. Taking a constant flow of payments, irrespective of the underlying conditions and context of the borrower, is hardly ethical. All the great religions of the world have preferred equity sharing as a financing mechanism, rather than straight debt finance. Moreover, the widespread introduction of corporate limited liability has led to massive moral hazard, as the upside is retained by the shareholders, while the downside gets shifted to fixed-interest creditors and other stakeholders. The present system leads to excessive corporate debt, non-linearities and crises.

Could the explosion of big data, and perhaps changes in accountancy conventions, enable a shift to equity finance via participation, for example in the form of Islamic Banking. There is the well-known story of entrepreneurs having three sets of books, one for the taxman, one for the other shareholders, and the true one for managerial insiders. At the moment, managerial insiders have a massive informational advantage over everyone else, except perhaps institutional holders of very large blocks of shares. Only if technological advantages allow information to be more commonly shared and widely available, could one expect a major shift towards equity finance.

4 Money as an Informational System

The need for money is closely related to informational problems. If people do not know whether X will repay her debt, a claim on X cannot be used to pay for purchases from Y. So, what one needs in order to obtain a means of payment is to replace the uncertain-value claim on X with a claim on Z, with the latter being a much stronger debtor, in most cases the head of state, (or an asset, such as gold, whose value has been guaranteed by Z). Note that high-value metals, such as gold and silver, are extremely difficult to use as a medium of exchange, unless their metallurgical content has been guaranteed by the stamp of authority, i.e. a coin. Recall the difficulty that Charlie Chaplin had in using gold dust to buy drinks in a pub in the Yukon, in the film

The Gold Rush. In order to use precious metals as a means of payment, their fineness has to be somehow attested.

So, we can think of money as an information system. But monetary systems can be organised to incorporate more or less information on counterparties to a transaction.

Some forms of money involve little information on counterparties. These include currency and, by construction, cryptocurrencies. Problems with both of these are that the lack of counterparty information makes them particularly attractive for anti-social uses in the grey/black economies. And currency also has the feature that it limits the ability to allow the authorities to introduce negative interest rates. This latter constraint is probably exaggerated, in the sense that the main objection to negative interest rates will always be political. The suggestion that the authorities want to make your savings worth less period by period is never likely to be a political selling point.

On the other hand, certain monetary systems involve considerable information about counterparties, in particular centralised ledger systems. The problem with such high information systems is that they can be used for authoritarian purposes, especially by governments.

Essentially the question for societies is how much information do we want others to have on our financial transactions, and then perhaps to use to their own advantages?

It may be most efficient for the government, perhaps in the guise of its Central Bank, to be in a position to know all our financial transactions. But, even if we were entirely upright citizens, and very few of us are fully such, are we confident that the government, and with it the Central Bank, may not fall into the hands of authoritarian, dictatorial and corrupt hands?

How about the tech companies? But their business model is to finance the provision of services to individual users by selling information to third parties, whose use of such information most of us are barely aware of. The recent example of Facebook's use of our information must act as a warning about whether we want our financial information to become subject to uses outside of our control.

In many ways commercial banks have been well behaved in using the information that their command over the majority of our monetary system has given them. While there have been a few cases of such misuse, they have been rare. It would, in my view, be dangerous to pursue efficiency at the expense of privacy.

5 Central Bank E-money

There is considerable interest in whether Central Banks might issue digital currency, e-money, to a much wider range of agents in the economy, perhaps to everyone. It should, however, be noted that this would sharply reverse the concordat that became implicitly agreed between commercial banks and Central Banks at the beginning of the 20th century. This was that the commercial banks on their part would accept overall monetary control and increasing supervisory oversight by the Central Bank, whereas

in return the Central Bank would abstain from direct commercial competition with the commercial banks. Unless carefully managed, the issue of digital currency by Central Banks might bring them directly into competition with the commercial banks.

What can Central Banks offer on this front that commercial banks cannot? See, for example, the excellent BIS report, by Bech and Garratt (2017). One of both the main advantages, and disadvantages, of Central Bank money, is that it would involve significantly less credit risk than claims on commercial banks. In normal times, the interest rate offered by commercial banks, and their other services, notably access to credit, would probably make most clients prefer to hold their monetary balances with commercial banks. But in potential crises, this could change in the flash of an eye. In his accompanying paper, Brunnermeier refers to financial practices where micro prudence may lead to macro disaster. This could be the case were Central Banks to offer available accounts to all-comers. The switch out of commercial banks into the safety of the Central Bank could provide 'the mother of all runs'. Moreover, if there should be a major shift of monetary financing out of commercial banks into the Central Bank, what would be the counterpart assets that the Central Bank would hold? If they hold only public sector debt, the public sector will benefit, but the private sector will equivalently lose access to credit, or find it only available on significantly worse terms. For a Central Bank to hold large volumes of private sector debt is problematical, for obvious political reasons. The way that the present monetary system has been set up involves significant, partly hidden, subsidies and advantages to private sector borrowers. They would be loath to lose these.

There are, indeed, possible efficiency benefits from the issue of Central Bank digital money; for example, there may be lower transaction costs than relying on currency; the Riksbank seems to think so. Perhaps more important, cross-currency financial transactions are currently expensive and inefficiently done. Think of the spread on exchanging currencies. Could digital currencies improve international monetary transmission?

Nevertheless, my own assessment would be that the dangers involved in having Central Banks move to widespread provision of digital currencies to all potential clients still outweigh their potential advantages.

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Digitization of money and the future of monetary policy

By Peter Bofinger¹

Most economists will agree that the future of money will be more digital than today. But while everybody speaks of “**digitization**” the concrete meaning of this term remains very often unclear. Therefore I want to specify four major areas where digitization could modify the traditional forms of money and credit and as consequence also modify the theory and practice of monetary policy. In my view the most interesting trends are the following:

- The substitution of cash by electronic money
- The substitution of traditional bank deposits and bank notes by cryptocurrencies
- The substitution of bank deposits by central bank deposits for everyone (“universal reserves”)
- The substitution of bank lending by peer to peer lending on the basis of digital platforms

1 Substitution of cash by electronic money

An area where digitization has already made progress is the use of cash in payments. In the member states of the euro area from 1980 until today the share of cash in the money stock M1 has declined from 23% to 14%. But as a recent study by the ECB (Esselink and Hernández 2017) shows in terms of number, still 79% of all transactions were carried out using cash, which amounts to 54% of the total value of all payments. But as this study states this could change rapidly, as payment cards and POS terminals are more and more enabled with contactless technology for payments under 25 Euro and 81% of all payments at point of sales in the euro area are under this threshold.

What would a completely cashless economy imply for monetary policy? First, it would remove the zero-lower bound for interest rates. This would increase the central bank’s room for maneuver in deep recessions, above in a deflationary environment. Second, it would remove the risk of a general bank run, as depositors could only switch their deposits between banks but not totally out of the banking system. This would reduce the need for the central bank to become active as lender of last resort. On the other hand could argue, if savers can no longer withdraw their deposits, this could reduce or even remove the market discipline for the banking system.

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But for these effects to materialize it is not sufficient that the usage of cash approaches zero over time. It would require that cash is totally abolished. Because as long as the convertibility of bank deposits in cash is possible, the use of cash could rapidly rebound if interest rates become significantly negative or if the health of the whole banking system is at stake.

Thus, in the area of cash digitization by itself cannot lead to a qualitative change for monetary policy. But it could facilitate a political decision to abandon cash altogether. However, at least from the German point of view, and I have made my personal experience with the proposal to abolish cash, a fully cashless euro area is very unlikely for the time being.

2 Substitution of traditional monetary base and money stock by cryptocurrencies

A second challenge to the traditional concepts of money and monetary policy comes from cryptocurrencies like Bitcoin. They can be regarded as the realization of Hayek's dream of a "denationalization of money" from 1976. Hayek was not very precise about the concrete implementation of such a system of "competing currencies". He mainly had in mind private banks issuing banknotes leaving it open whether they are convertible not. For a discussion of these issues it is useful to have a taxonomy which makes it possible to classify types of money along for criteria:

1. private versus public issuer
2. convertible versus non-convertible money
3. physical versus electronic money, and
4. money which is transferred in a peer-to-peer nature and money which is transferred in accounting systems with a central book-keeping agency.

Graphically such a taxonomy can be represented by a money-flower. The idea goes back to the BIS (Bech and Garratt 2017). But instead of criterion "convertibility versus non-convertibility"² the BIS uses the criterion "limited versus general accessibility". The other three criteria are the same.

Without going into details, the taxonomy makes clear that due to their inconvertibility cryptocurrencies have a strong similarity with the traditional central bank reserves and cash monetary base or cash. In this respect cryptocurrencies differ from bank deposits which promise convertibility in cash.

Are cryptocurrencies a serious challenge to cash, traditional bank deposits or central bank reserves? Due to their inconvertibility they do not have an intrinsic value. While this is also true for cash and central bank deposits, the monies issued by the central banks have the enormous advantage of being legal tender. This is an important

² This is identical with the "inside versus outside money" definition of money.

protection against the full implosion of the value of a money without intrinsic value. An important additional value protection is provided by the legal mandate of the ECB “to maintain price stability” which so far has been achieved remarkably well.

While an individual issuer of a cryptocurrency can try to install a value guarantee by setting an upper limit for the issuance of its currency, the logic of currency competition implies that there is no limit of the number of issuers thus no limit of the total amount of the aggregate stock of cryptocurrencies. Thus, holding a cryptocurrency always bears the completely unpredictable risk of a total loss. In other words, as a store of value the high volatility of cryptocurrencies makes them unattractive for most investors.

In addition, they are also not attractive as a means of payment. As Bitcoin shows production costs are increasing, transactions costs and transaction times are high and all transactions are public.

Overall, I do not expect that cryptocurrencies have to potential to replace the established national monies and to have a relevant impact on monetary policy making. As far as they are used to circumvent laws against money laundering adequate legal restrictions are required.

3 Universal reserves: substituting cash and bank deposits by central bank deposits for every one

With the emergence of cryptocurrencies and the reduced demand for cash especially in countries like Sweden some central banks have started to develop concepts for allowing non-banks to hold deposits with the central. The most elaborate concept is the E-Krona developed by the Swedish central bank.

Digital central bank money for non-banks could become a substitute for cash, especially if the value is stored locally on an app or a card (value-based solution). At the same time it could become a substitute for traditional bank deposits if the balance is stored in accounts in central data base (register based solution).

The introduction of digital central bank money for non-banks would not necessarily require an accounting mechanism which is based on distributed ledger. And even in the case of a distributed ledger it must not be blockchain.³

Deposits with the central bank could become a very attractive investment as they would provide a totally safe asset. This feature which would be appreciated above all by private households and firms with bank deposits exceeding 100.000 euro. With Bank Recovery and Resolution Directive such investors are exposed to the risk of a bail-in which they could avoid by holding central bank deposits. Of course, the attractiveness of such deposits depends on their interest rate relative to the interest rate of bank deposits.

³ Corda replaces blockchain with a “notary” architecture. The notary design utilises a trusted authority and allows consensus to be reached on an individual transaction basis, rather than in blocks, with limited information-sharing.

Assuming a situation where all citizens have a bank account with the central bank, the run risk or commercial banks would be increased, as it makes it much easier to switch especially higher deposits out of the banking system. In an even more extreme scenario where all citizens hold overnight deposits the central bank, the central bank's room for maneuver would again be increased. It would not only be easier to enforce negative interest rates. It would be also become technically possible to use the instrument of helicopter money. The central bank would simply credit a certain amount to the account of each citizen.

Widely used central bank deposits would fundamentally transform the role of banks and their relationship with the central bank. The banks would still be able to provide loans. But the banking system would then always need a corresponding refinancing from the central bank, as the loans have to be paid out on the central bank deposit of the borrower. This would come close to the concept of full-reserve banking restricting the bank's ability to create loans autonomously. However, it does not imply a 100% refinancing by the central bank. The banking system could always try to attract a longer-term refinancing from the non-banks out of their central bank deposits.

Digital central bank money for all could also have far-reaching implications for payments system which is currently based on bank accounts. The role of banks could be reduced in favor of non-banks offering payments services based on central bank accounts. This could offer a potential for innovation and competition in payments services. Therefore, in my view, central banks should refrain from providing payments services.

4 Peer-to-peer lending substituting traditional bank lending

A fourth possible innovation is the substitution of traditional bank loans by peer-to-peer lending. China is leading in this field and it shows the risks and the regulatory challenges that are associated with this instrument.

Conceptually P2P-lending has many similarities with capital market lending as it established a direct relation between lenders and borrowers. One can say that P2P-lending creates a capital market for small borrowers. Digitization has the potential to widen the scope of this form of finance, especially if it is based on established internet platforms.

1. Using information from credit scores, social networks or platforms like Amazon P2P-platforms can provide the screening and delegated monitoring which is core function of banks in an environment with asymmetric information.
2. By distributing the investments over a large group of borrowers P2P-lending can also offer the traditional diversification provided by banks.

As peer to peer lending does not need an intermediary which bears risks it has the advantage that it needs less regulation than traditional bank lending. This concerns above all capital requirements and liquidity requirements. So far P2P-lending is still in

its infancy, but it could have the potential to become a similar challenge to the traditional bank business as Uber to the traditional taxi business.

For the central bank an uberization of banking could imply less influence on financial processes and also real processes.

But as long as bank deposits remain the basis for this form of financing the central banks will be able to influence it by its interest rate policy. The decision of an investor to use money which is held on a bank account for P2P-lending will depend on the interest rate that she receives for such a deposit. With its control of the money market interest rate the central bank can indirectly target the interest rates for such deposits.

5 Digitization of money does not erode the power of central banks

The digitization of money has the potential to change traditional structures of the financial system. It can redefine the roles of banks and central banks.

But, by itself digitization does not erode the control of **central banks** over the financial system. Massive regime changes (abolishment of cash, universal central bank reserves) are possible. But they would require a political decision and they would strengthen the role of central banks.

Banks could be massively challenged by new forms of intermediation, above all by P2P lending. The decision by central banks to offer central bank accounts for all would fundamentally change the function of banks, above all by limiting their ability to create loans autonomously. In addition, this could also reduce the importance of banks in the provision of payments services.

In spite of **cryptocurrency hype** I do not regard them as a serious game changer. They may have some attraction for investors but they will hardly come into a position that they could threaten the dominant role of national currencies and bank deposits which are based on them.

The future of monetary policy and macroprudential policy

By Lars E.O. Svensson¹

Abstract

The objective of ECB's monetary policy may be further clarified as "price stability and full employment without prejudice to the price-stability objective," where "without prejudice..." means that average inflation over a period such as five years shall be close to a symmetric inflation target of 2%. "Forecast targeting" with publication also of the policy-rate path is likely to best achieve the ECB's monetary policy objective and also strengthen the ECB's accountability. Financial stability is a suitable objective for macroprudential policy but not for monetary policy. Monetary policy and macroprudential policy are very different policies and normally best conducted separately. In macroprudential policy, it is important to distinguish between good and bad credit growth. Intervening to prevent good credit growth has potentially severe costs, as has not intervening to prevent bad credit growth. Swedish macroprudential policy to reduce credit supply to households by further tightening already quite tight lending standards provides an example where this distinction is apparently disregarded and the welfare costs are high. Macroprudential policy is likely to benefit from clear objectives, committee decision-making, and strengthened accountability mechanisms.

1 Introduction

I am very happy and feel very honored to have been asked to speak at this colloquium to honor Vice President Vítor Constâncio and to contribute a paper to the Festschrift in honor of Vítor and his achievements. My assignment is to talk about "The Future of Monetary Policy and Macroprudential Policy." A reasonable approach to this, I thought, is first to read what Vítor himself has said on this topic and then to consider whether I have something to add, or perhaps to disagree with.

Indeed, Vítor has in the last year talked at length about both topics. On monetary policy, he gave a lecture on "The Future of Monetary Policy Frameworks" in Lisbon in May 2017 (Constâncio, 2017b) and a speech on "The Past and Future of ECB Monetary Policy" in Malta in May this year (Constâncio, 2018b). On macroprudential

¹ Stockholm School of Economics, CEPR, and NBER. A preliminary version of this paper was presented at The Future of Central Banking: An ECB Colloquium Held in Honour of Vítor Constâncio, Frankfurt, May 16-17, 2018. I am grateful to Donald Kohn, Philip Turner, the discussant Dirk Schoenmaker, and participants in the colloquium for comments. Support from the Knut and Alice Wallenberg Research Foundation is gratefully acknowledged. Any views expressed and any errors are those of the author.

policy, he gave a speech on “The Future of Finance and the Outlook for Regulation” in Rome in November 2017 (Constâncio, 2017a) and another speech on “Financial Stability Risks and Macprudential Policy in the Euro Area” in Frankfurt in March this year (Constâncio, 2018a). The lecture and the speeches cover a lot of ground.

Regarding monetary policy, the topic of the Lisbon lecture and the Malta speech, Vítor speaks favorably about flexible inflation targeting and finds that it is consistent with ECB’s monetary policy strategy. He provides a thorough discussion of the many suggestions to modify the inflation-targeting framework that have been presented. He discusses the role of financial stability in monetary policy, price-level targeting, nominal-GDP-targeting, simple interest-rate rules, raising the inflation target, whether non-standard monetary policy tools should become standard, the size and composition of central-bank balance sheets, negative interest rates, abolishing cash, helicopter money, and the Neo-Fisherian view that the policy-rate should be raised in order to increase inflation.

In particular, Vítor is skeptical about incorporating financial-stability considerations into monetary policy decisions. He explains why inflation targeting cannot be blamed for failing to prevent the financial crisis. He notes that monetary policy “leaning against the wind” for financial-stability purposes (LAW) may be very costly.

Vítor discusses whether price-level targeting would perform better than inflation targeting in that, if the price level falls below the target, a credible price-level target would lead to higher inflation expectations and a lower real policy rate, also when the policy rate is constrained by the effective lower bound (ELB). But he doubts whether the price level target would be sufficiently credible and notes that a lack of credibility can lead to worse outcomes. On balance, he is therefore against price-level targeting.

Vítor also discusses the arguments in favor of raising the inflation target because of lower neutral rates and a higher risk of reaching the ELB. Because of — often disregarded — broader costs of higher inflation and of the availability of other monetary policy instruments, he finds the idea of raising the inflation target very controversial.

In the Malta speech, Vítor provides a rich and informative historical perspective on the different phases of ECB’s monetary policy since the beginning in 1999, including the controversial policy-rate hikes in the spring of 2011. He furthermore provides a detailed and insightful discussion of the lessons of the financial crisis for central-bank macroeconomic models, the Phillips curve, and different concepts and estimates of equilibrium unemployment rates.

Regarding macroprudential policy and regulation, the Rome speech provides thorough and detailed discussions of developments in finance and the need for future regulatory reform. The Frankfurt speech takes up the debate about the relation between monetary policy and macroprudential policy and whether or not monetary policy should undertake any LAW.

Vítor is firmly on the side that considers that monetary policy and macroprudential policy are different and should remain separate. This implies that monetary policy

should not respond to financial stability concerns and thus not undertake any LAW. The main argument justifying this stance is that macroprudential policy is now available and is the most effective tool for safeguarding financial stability. This is because macroprudential policy instruments can directly address excessive leverage behavior and do not have the same cost or negative spillovers as monetary policy LAW.

Indeed, Vítor presents an update for the euro area of the kind of cost-benefit analysis of monetary policy LAW that I have proposed (Svensson, 2017a). He shows that, also for the euro area, the costs of are much higher than the benefits. Importantly, he also presents a cost-benefit analysis of macroprudential policy, and he shows that then the benefits exceed the costs, in particular, when macroprudential policy responds to an ECB measure of a euro-area financial cycle.

I said above that I was looking for something to add to — or to disagree with — what Vítor has already said. But now, after having read the lecture and the speeches, I do have a problem: There is little or nothing to add, or to disagree with! Vítor has more or less already said all there is to say. Furthermore, except being more positive to price-level targeting than Vítor is, I more or less completely agree with what he has said. Given this, I will only make a few very selective remarks on the future of monetary and macroprudential policies in this paper.

Regarding the future of monetary policy, I will say something about how the ECB could improve its objective to be clearer and more transparent. In particular, a difficulty with the current formulation is that it is not clear what the precise operational meaning is of the expression “without prejudice to the objective of price stability.” I will suggest that an appropriate interpretation is that average inflation over a longer period, say five years, should be on or close to the inflation target. This can furthermore arguably be seen as a moderate step towards price-level targeting — I hope Vítor is not against this moderate step.

In addition, I will suggest that flexible inflation targeting in general, and for the ECB in particular, can be further developed to be more effective and transparent by more explicit and transparent “forecast targeting.” Here, forecast targeting means choosing a policy rate and policy-rate path such that the corresponding forecasts of the central bank’s target variables “look good.” Here, “looking good” means best achieving the monetary policy objective. Importantly, transparent forecast targeting also involves publishing and justifying not only the forecasts of the target variables but also the policy-rate path and this way trying to make them credible with the private sector and the policy more effective.

I will also say a few things related to the still ongoing debate on whether or not financial stability is a suitable additional objective of monetary policy and whether or not monetary policy should undertake any LAW (in spite of Vítor having said a fair amount on this). I will remind us about the rather extraordinary Swedish experience of monetary policy LAW during 2010{2014 and say a few things about a cost-benefit analysis of LAW, including Vítor’s update for the euro area.

Regarding the future of macroprudential policy, I will remind us about the arguments about whether or not monetary and macroprudential policies are different and whether or not they are best conducted separately. In particular, I will emphasize the importance in macroprudential policy to distinguish between good and bad credit growth. There is a trade-off between, on one hand, failing to intervene to stop bad credit growth in time to avoid potentially severe costs to the economy and welfare losses and, on the other hand, being overly activist and intervening to stop good credit growth and this way cause potentially severe costs for the economy and welfare losses.

As an example of the importance of distinguishing between good and bad credit growth, I will point to the current Swedish macroprudential policy and a possible problem with it. Here, Finansinspektionen (the Swedish Financial Supervisory Authority, which is in charge of macroprudential policy) has essentially reduced credit supply to households by implementing and inducing tighter lending standards in a situation when lending standards initially were quite tight. This is done in an attempt to reduce household debt growth in the belief that it is bad credit growth that causes an “elevated macroeconomic risk.” But Finansinspektionen or any other authority has hardly been able to make a case for why credit growth would be bad, excessive, or due to some market failure, why it would cause some elevated macroeconomic risk. Finansinspektionen has not presented any cost-benefit analysis in support of its policy. It seems simply to consider all household debt growth above income growth as bad. A closer look at the relevant indicators and Finansinspektionen’s arguments strongly suggest that lending standards were not too low before the new tightening policy, that the household debt growth above income growth is fully consistent with the fundamentals and is a normal market response to these fundamentals, and that there is no evidence of it causing an “elevated macroeconomic risk.” Furthermore, the policy has substantial negative welfare and distributional effects and is likely to reduce the resilience of households.

The paper is organized as follows: Section 2 deals with the future of monetary policy, with section 2.1 on the objective of monetary policy, section 2.2 on forecast targeting, section 2.3 on financial stability as an objective of monetary policy, including the Swedish example of LAW and a cost-benefit analysis of LAW, and section 2.4 with some conclusions on monetary policy. Section 3 deals with the future of macroprudential policy, with section 3.1 on how different monetary and macroprudential policies are and whether or not they are best conducted separately, section 3.2 on the definition of financial stability, section 3.3 on distinguishing good and bad credit growth, section 3.4 on the possible problem in Swedish macroprudential policy, and section 3.5 with some conclusions on macroprudential policy.

2 Monetary policy

Regarding future monetary policy, Vítor “believes that the strategy of flexible inflation targeting works for the euro area and can remain central to any future monetary policy framework”, (Constâncio, 2017b, p. 17). He also notes that:

[f]lexible inflation targeting implies that the central bank attempts to reach the [inflation] target gradually in the medium-term and not in the immediate period. ... [T]his gradualism is equivalent to an objective function that includes both the inflation rate deviation from its target and the output gap. This is close to inflation targeting regimes of central banks with a *dual mandate* but with *primordial importance* given to inflation... (Constâncio, 2017b, p. 2).

This sounds to me as consistent with the standard quadratic loss function representing flexible inflation targeting, except possibly for the phrase “primordial importance given to inflation.” Let me extend a bit about the ECB’s objective for monetary policy and how I believe it can be expressed somewhat more transparently. Indeed, I believe that the ECB’s objective can be formulated as “price stability and full employment,” with price stability as the primary objective and with the objective of full employment being without prejudice of the price-stability objective. Possible alternatives to “full employment” are “maximum sustainable employment,” “minimum sustainable unemployment,” “maximum sustainable output,” “full resource utilization,” “real stability,” etc., which with the appropriate explanation will for practical purposes have the same meaning. Let me in the rest of the discussion simply use the term “full employment.”²

But this requires a clarification of what “primary” and “without prejudice to the objective of price stability” means.

2.1 The objective of monetary policy

ECB (2018c) summarizes the objective of monetary policy as follows (quotation marks in original; italics and footnote 3 added)

To maintain price stability is the *primary objective* of the Eurosystem and of the single monetary policy for which it is responsible. This is laid down in the Treaty on the Functioning of the European Union, Article 127(1).³

“*Without prejudice to the objective of price stability*”, the Eurosystem shall also “support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union”. These include inter alia “*full employment*” and “balanced economic growth”.

...

² As is explained in Svensson (2011b), I am skeptical about the usefulness of estimates of potential output as a reliable measure of full resource utilization and believe that the estimated minimum long-run sustainable rate of unemployment (or the maximum long-run sustainable rate of employment, when the labor-market participation rate is sufficiently endogenous) normally is a more reliable measure.

³ The full Article 127(1) states: “The primary objective of the European System of Central Banks (hereinafter referred to as ‘the ESCB’) shall be to maintain price stability. Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union. The ESCB shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119.”

The Treaty provisions also imply that, in the actual implementation of monetary policy decisions aimed at maintaining price stability, the Eurosystem should also take into account the broader economic goals of the Union. In particular, given that monetary policy can affect real activity in the shorter term, *the ECB typically should avoid generating excessive fluctuations in output and employment* if this is in line with the pursuit of its primary objective. ECB (2018c)

Again, I think most readers get the impression that it is pretty consistent with a standard quadratic loss function, except the reference to “primary objective” and “without prejudice ...”

2.1.1 Without prejudice to the objective of price stability

So, what does the clause “without prejudice to the objective of price stability” mean? I believe that the clause can cause, and has caused, some confusion. I am not aware of the ECB having clarified its precise operational meaning. As far as I can see, as discussed in Svensson (2013, pp. 33-34), an appropriate interpretation is that average inflation over a longer period should be kept on or close to the target, and that allowing average inflation over a longer period to deviate from the target, above or below, is to show prejudice to the objective of price stability.

It is not possible to keep inflation at the inflation target all the time, because the control of inflation is imperfect because inflation is affected by unobservable shocks and responds with a lag to monetary-policy actions. Thus, some deviations of inflation from the target are unavoidable and do not mean that there is prejudice to the price-stability objective. However, it is possible to keep average inflation on target over a longer period, such as 5-10 years or longer. Thus, a deviation of average inflation from the target over a longer period can be seen as indicating prejudice to the price-stability objective.

Given this, the objective of price stability and full employment means stabilizing inflation around the inflation target and employment around its estimated long-run sustainable rate. Furthermore, average inflation over a longer period, say 5 years, should normally be close to the inflation target.⁴ This has actually been achieved by the central banks of Australia, Canada, and the UK from the mid-1990s and by the Fed and the ECB from 2000 until about 2013, but not by the Riksbank (Svensson, 2013, 2015).

2.1.2 The quantitative definition of price stability

The ECB's Governing Council adopted a quantitative definition of price stability in 1998: “Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%.” The Council clarified in 2003 that in the pursuit of price stability it aims to maintain inflation rates *below, but close to,*

⁴ Average inflation targeting is discussed in Nessén and Vestin (2005).

2% over the medium term (ECB, 2018a). In practice, this may perhaps mean 1.8-1.9%.

Under the heading “Symmetry,” the ECB’ states:

By referring to “inflation rates below, but close to, 2%” the definition makes clear that not only inflation above 2% but also deflation (i.e. price level declines) is inconsistent with price stability.

This statement about symmetry sounds to me somewhat inconsistent with “below but close to 2%.” It sounds more like symmetry around an interval between 0% and 2%, that is, symmetry around a midpoint of 1%. A symmetric 2% inflation target would be clear and unambiguous. It is difficult to see any disadvantage with it.

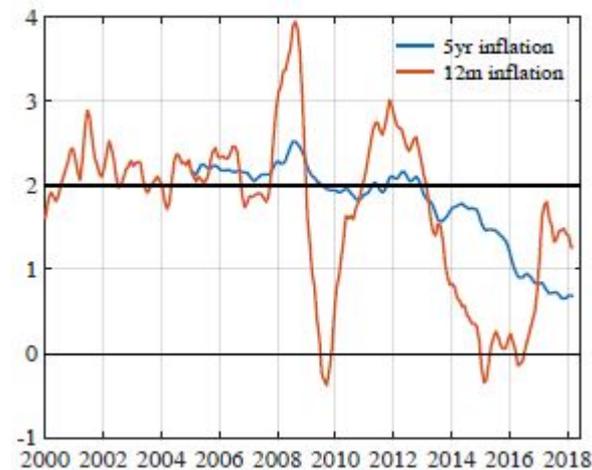
2.1.3 A moderate step towards price-level stability

Figure 2.1 shows that past monetary policy of the ECB has done relatively well regarding price stability in the light of these suggestions. Five-year inflation was initially a bit high but has then been relatively close to 2% until 2013, when in spite of a low policy rate and unconventional monetary policy inflation fell substantially below the target, to a large extent because of collective fiscal consolidation in the euro area (as Vítor emphasizes, Constâncio, 2018b).

Figure 2.1

12-month and 5-year inflation (at an annual rate) for the euro area (HICP)

(3-month moving averages)



Source: Thomson Reuters Datastream.

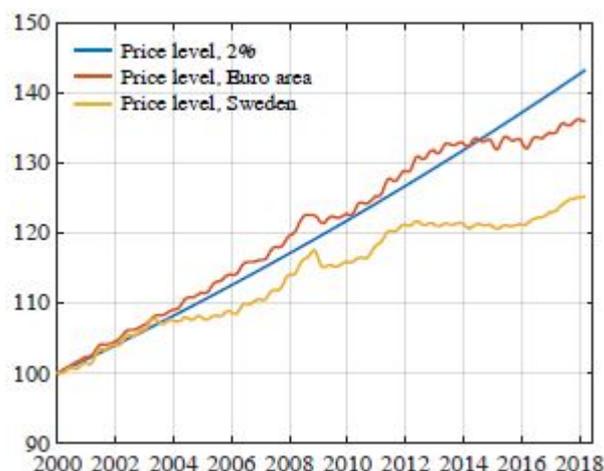
As mentioned, I am somewhat more favorably inclined towards price-level targeting than Vítor. Keeping 5-year average inflation close to the inflation target can be seen as a moderate step towards price-level targeting. If this moderate step towards price-level targeting works well, one may want to take further steps towards price-level targeting.

It is interesting that the ECB ex post has been a pretty successful price-level targeter except in the last few years, as shown in figure 2.2. Several other inflation-targeting central banks have also ex post, up to the financial crisis, kept inflation close to a 2% price-level path. The Riksbank is a major exception, where 5-year average inflation has been below 2% and the price level has drifted ever further below a 2% price level path (Svensson, 2013, 2015).

Figure 2.2

Price level growing at 2%, price level for the euro area (HICP), and price level for Sweden (CPI)

(3-month moving averages)



Source: Thomson Reuters Datastream.

2.2 Achieving the objective: Forecast targeting

How can the central bank best achieve the objective of flexible inflation targeting — price stability and full employment — over time and also make the central bank's policy sufficiently transparent so that the central bank can be held accountable for fulfilling the mandate? One possibility that has received considerable attention, especially in the US, is for the central bank to follow a simple rule for setting its instrument, such as a Taylor rule (Svensson, 2017c).

Indeed, the House of Representatives of the US Congress has in the Fed Oversight Reform and Modernization (FORM) Act (U.S. Congress, 2015) and, with identical words, in the Financial CHOICE Act (U.S. Congress, 2017) proposed legislation that effectively makes the original Taylor (1993) rule a Reference Policy Rule for the Federal Reserve. Any departures from that rule would require a detailed justification for that departure and could trigger a full review of monetary policy and a report to the Congress by the US Government Accountability Office. As explained in a letter from then-Chair Yellen to the Congress (Yellen, 2015), for several reasons the provisions of the FORM Act would severely impair the Federal Reserve's ability to carry out its congressional mandate to promote effectively the goals of maximum employment and stable prices.

Vitor is no fan of such simple rules (Constâncio, 2017b, p. 5):

I strongly oppose the idea that central banks' policy rate decisions should be based on these rules. The key reason is that any specific rule is unlikely to be suited for all possible contingencies. The environment in which monetary policymakers have to act is much more complex than what is assumed in model-based analysis of policy rules. A simple rule that responds to one or two macroeconomic variables and ignores all other indicators of price developments is not able to account for the complexities of the real world.

I agree with Vitor. My view is furthermore that *forecast targeting* is superior to a Taylor rule and likely to allow the central bank to effectively fulfill its mandate as well as to be held accountable for fulfilling the mandate (Svensson, 2011a, 2017c). Forecast targeting means setting the policy rate (the short interest rate that is used as a monetary-policy instrument) and the policy-rate path so that the resulting forecasts for the central bank's "target variables," inflation and employment (or unemployment), best fulfill the central bank's mandate of full employment and price stability. Forecast targeting also involves publishing and justifying the central bank's policy-rate path and forecasts for inflation and employment. This serves to effectively implement the selected policy in order to make it credible with the financial market and other economic agents as well as to make it possible to hold the central bank accountable for fulfilling its mandate.

To clarify how inflation targeting works, consider for simplicity a situation of relatively normal times, when the central bank is not doing any active balance-sheet policy but is only using a policy rate as its policy instrument. Furthermore, assume for simplicity that the labor-market participation rate is independent of monetary policy, so that for monetary policy purposes employment varies negatively one-to-one with unemployment. Under this simplification, the central bank's mandate is to keep inflation close to its target of 2% and unemployment close to its estimated long-run sustainable unemployment rate. Then, inflation and unemployment are the central bank's target variables.

Two important circumstances then need to be taken into account: First, monetary policy actions tend to influence economic activity and prices with a lag. Therefore monetary policy is more effective in fulfilling the mandate if it is guided by *forecasts of future* inflation and unemployment than by *current* inflation and unemployment.

Second, the current policy rate has a very small direct impact on economic activity and prices. What matters for economic activity and prices is, instead, market *expectations of future* policy rates. These expectations affect longer-term interest rates and asset prices, which in turn have an impact on activity and prices. It is the entire expected path of future policy rate that affects economic activity, not the policy rate over the next few days and weeks. This means that an effective monetary policy decision cannot only consist of setting the current policy rate; it must explicitly or implicitly also involve the selection of a policy-rate path, a forecast of the future policy rate. *Not to discuss and select a policy-rate path is an incomplete decision-making process.*

Given this, a rule for the central bank that effectively fulfills its mandate is to select a policy rate and a policy-rate path so that the resulting forecasts for inflation and unemployment “look good.” Here, “looking good” means best fulfilling the central bank’s mandate, that is, best stabilizing inflation around its target and unemployment around its long-run sustainable rate.

Why is this rule, forecast targeting, better than, for instance, a Taylor-type rule? First, it takes into account all relevant information available to the central bank. It takes into account the information about the economy, economic activity, and prices that has an impact on the forecasts of inflation and unemployment at a given policy-rate path. It also takes into account all relevant information about the transmission mechanism of monetary policy, that is, how changes in the policy-rate path affect the forecasts of inflation and unemployment at given information about the current state of the economy. Second, the rule therefore adapts to new information and changes in circumstances, and it allows for judgmental adjustments. It avoids the restrictiveness and inflexibility of a Taylor-type rule. The selected policy-rate path and forecasts of inflation and unemployment will in practice be a combination of model simulations, sometimes from several models, and judgmental adjustments.

However, for successful implementation and realization of the selected policy, the policy-rate path needs to be credible, in the sense of market expectations of future policy rates being aligned with the policy-rate path. Implementation of monetary policy is largely about the management of expectations (Woodford, 2004). This includes making the *actual* financial conditions align with the *intended* financial conditions, where the latter can be seen as represented by the policy-rate path.

Economic agents’ expectations of future inflation also matter. If the central bank manages to make the inflation target credible, in the sense of making economic agents’ inflation expectations align with the inflation target, stabilization of inflation around its target is easier, because actual inflation is much affected by previous expectations of inflation. Then it is also easier to stabilize unemployment around its long-run sustainable rate. The trade-off between stability of inflation around the target and of unemployment around its long-run sustainable rate becomes more favorable.

2.2.1 Publishing the policy-rate path and forecasts of the target variables

The most effective contribution to making the policy-rate path credible with the market participants and other economic agents is to publish the policy-rate path and the forecasts of inflation and unemployment and justify them and the policy decision. *Not*

to publish the policy-rate path is to hide the most important information. Forward guidance is then the default.⁵

It is common to argue that central banks should convey their reaction function to the market participants and other economic agents. However, under forecast targeting the reaction function, meaning how the policy rate and the policy-rate path respond to information available to the central bank, is far too complex to write as a simple formula such as a Taylor-type rule. It is actually too complex to write down, period. The policy rate and policy-rate path will normally respond to all relevant information, that is, all information that shifts the forecasts of inflation and unemployment. This is a long and changing list, with response coefficients that cannot be specified in advance.

But the reaction function can be conveyed in more general but still both systematic and simple terms. If initially the forecasts look good, for any piece of information that shifts the inflation forecast up (down) and/or shifts the unemployment forecast down (up), policy will normally be tightened (eased), meaning that the policy-rate path will shift up (down). If this response is understood by and credible with the market participants, any new information that is deemed to shift up (down) the inflation outlook or shift down (up) the unemployment outlook, may result in a market response that shifts up (down) the yield curve. This way the financial conditions may shift in the appropriate direction and even of the appropriate amount even before the central bank has responded with a new policy rate and policy-rate paths at the next decision.

Finally, the publication and justification of the central bank's policy-rate path and inflation and unemployment forecasts make it possible to hold the central bank accountable for fulfilling the objective. The policy-rate path and forecasts of inflation and unemployment, the central bank's justification of them and its fulfilment of its mandate can be scrutinized and reviewed both in real time and after the fact, that is, after the outcome for inflation and unemployment have been observed, by external observers and experts and at the usual hearings in parliamentary committees.

2.2.2 A forecast-targeting rule

The forecast-targeting rule can be summarized as these three steps (when resource utilization is taken to be measured by the unemployment gap):

1. For a given policy-rate path (for example, the policy-rate path from the previous decision), construct new inflation and unemployment forecasts, taking into account new information received since the previous decision.

⁵ Thus, there is forward guidance in the form a published policy-rate path. Normally, this is a forecast conditional on current information, not a commitment. In exceptional situations, for example, when the central bank is restricted by the effective lower bound for the policy rate, it may be a commitment through a certain date (time-dependent) or conditional on a specific outcome of inflation or employment (state-dependent). See Bernanke (2017) for a recent discussion. (Because the lower bound for the policy rate is not zero but negative, the *effective* lower bound is a more appropriate term than the *zero* lower bound.) Forward guidance in the form of publishing a policy-rate path is called *conventional* forward guidance in Adrian et al. (2018, ch. 1). The ad hoc forward guidance during and after the financial crisis in the form of various announcements about future settings of interest-rate and balance-sheet policies is called *unconventional* forward guidance.

2. If the new inflation and unemployment forecasts “look good” (meaning best fulfilling the man-date), select the given policy-rate path as the decision; if the new inflation and unemployment forecasts do not look good, adjust the policy-rate path so that they do look good.
3. Publish the policy-rate path and inflation and unemployment forecasts and justify the decision in order to make the published path and forecasts credible, meaning making market participant’s and other economic agents’ expectations align with the published path and forecasts. The justification of the decision may include the publication of inflation and unemployment forecasts for alternative policy-rate paths different from the selected one and the demonstration that these forecasts do not fulfill the mandate to the same degree.

2.2.3 The Federal Reserve and the ECB

I believe that such a relatively explicit forecast-targeting rule would make flexible inflation-targeting work even better. The Federal Reserve has already practiced forecast targeting to a considerable extent (Svensson, 2017c). Publishing policy-maker forecasts poses some special problems when there are many members in the monetary policy committee, as in the ECB’s Governing Council and the Federal Reserve’s FOMC. However, the FOMC has shown in its “Summary of Economic Projections,” including the dot plot of policy-rate projections, that it is possible to publish at least a summary and illustration of policy-makers forecasts, also when they have rather different views (FOMC, 2018). I would think something similar would also be possible for the ECB’s Governing Council. Still, common policy-maker forecast of target variables and instruments is preferable, if possible, and will be more internally consistent.

The ECB currently produces staff forecasts with the policy-rate path given by market expectations (ECB, 2018b). This implies that the corresponding forecasts of the target variables do not necessarily “look good.” I think it would be a useful addition to also publish a staff forecast with a policy-rate path and forecasts of the target variables where these “look good,” or at least two alternative forecasts for a more and a less expansionary policy-rate path than the market expectations.

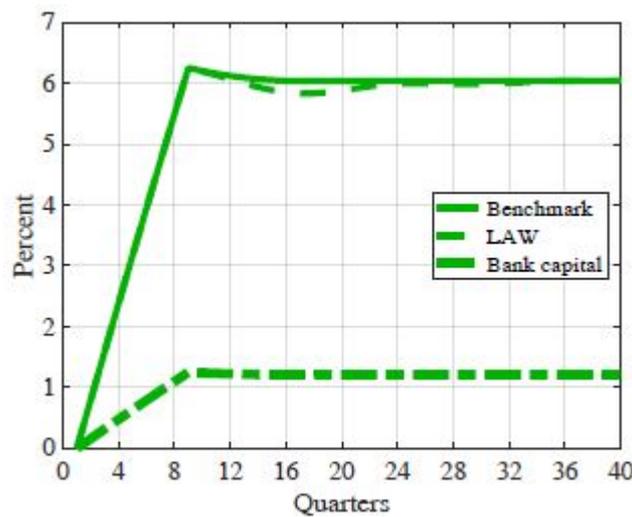
2.3 Financial stability as an objective for monetary policy

Whether financial stability should be an additional objective for monetary policy is much discussed and debated. I have discussed this issue at length, for example recently in Svensson (2018c), but I think the issue can be quite easily resolved. A reasonable principle for assigning goals to economic policies that should be uncontroversial is that *economic policies should only have goals that they can achieve*. Because monetary policy cannot achieve financial stability, it follows from the principle that it should not have financial stability as a goal.

As explained in Svensson (2018c), monetary policy has a strong and systematic effect on inflation and employment but normally a small and unsystematic effect on financial stability. Macroprudential policy has a strong and systematic effect on financial stability but normally a small and unsystematic effect on inflation and employment. In this situation, it is most effective to assign the objective of price stability and full employment to monetary policy and the objective of financial stability to macroprudential policy.

Figure 2.3

Effect on the probability of a crisis in future quarters from either a 1 percentage point higher policy rate during 4 quarters 1-4 or a ratio of bank capital relative to risk-weighted assets of 20%



Source: Dagher et al. (2016, fig. 7) and Svensson (2017a, figs. 2 and 7).

Figure 2.3 shows an example of a relevant quantitative result. It compares the effect on the probability of (having) a crisis in a future quarter of either LAW, in the form a 1 percentage point higher policy rate during quarters 1-4, or macroprudential policy, in the form of a permanent capital requirement of 20% bank capital relative to risk-weighted assets. It is based on the model and estimates in Svensson (2017a), where the details are explained.

The solid line shows the benchmark probability of a future crisis when the annual probability of a crisis start is 3.2% (corresponding to a crisis approximately every 33 years) and the duration of a crisis is 2 years (Svensson, 2017a, fig. 2).⁶ The dashed line shows how the annual probability of a future crisis is affected by LAW in the form of a policy-rate increase of 1 percentage point during quarters 1-4, when the case is tilted in favor of LAW by assuming that the policy-rate (unrealistically) has a permanent effect on real debt (Svensson, 2017a, fig. 7). The effect is nevertheless

⁶ There is no crisis in quarter 1. With a quarterly probability of a crisis start equal to 0.8% and a crisis duration of eight quarters, the probability of having a crisis in a future quarter rises to a steady-state level of approximately 6% (somewhat less than $8 \times 0.8 = 6.4\%$ because of a simplifying assumption that there can be at most one crisis in any 8-quarter period).

small, with a maximum reduction of the probability of a future crisis of 0.2 percentage point in quarter 17, and there is no long-run effect.

The dashed-dotted line shows the effect on the probability of a future crisis from macroprudential policy in the form of a bank capital requirement of 20%. The effect is large and reduces the probability of a future crisis permanently by about 4.8 percentage points to about 1.2%, a fifth of the benchmark probability. This is inferred from a result in Dagher, Dell’Ariccia, Laeven, Ratnovski, and Tong (2016, fig. 7). The result indicates that 20% bank capital relative to risk-weighted assets in the OECD countries would have been enough to cover the losses of about 80% of the historical banking crises since 1970. This is interpreted in figure 2.3 as permanently reducing the probability of a future crisis to one fifth of what it otherwise would have been.

It is sometimes suggested that the so-called risk-taking channel would increase the effect of monetary policy on the probability or severity of crises (for example Borio and Zhu (2008) and Adrian and Liang (2018)). But there is reason to doubt that any risk-taking channel is sufficiently strong to be economically significant.⁷

2.3.1 Leaning against the wind

Nevertheless, whether or not monetary policy should undertake LAW continues to be debated. This involves a tighter policy for financial-stability purposes than justified by standard flexible inflation targeting and has been strongly promoted by the BIS (for instance, BIS, 2014, 2016). It has been followed by Norges Bank (Olsen, 2015), the Reserve Bank of Australia, and the Riksbank (but was later, in the spring of 2014, dramatically abandoned by the Riksbank). But a robust result is that the costs of LAW are higher than the benefits, by a substantial margin. Raising the policy rate simply has too small and uncertain effects on the probability or magnitude of a financial crisis to match the certain substantial costs, in terms of lower inflation and higher unemployment (Svensson, 2017a).

Stein (2013) has put forward the arguably strongest *theoretical* argument in favor of LAW for financial stability purposes:

... while monetary policy may not be quite the right tool for the job, it has one important advantage relative to supervision and regulation—namely that it gets in all of the cracks [of the financial system].

⁷ Dell’Ariccia, Laeven, and Suarez (2017) provide a thorough examination of the risk-taking channel and the effect of the real federal funds rate on a measure of loan risk for US banks, using extensive confidential Federal Reserve data. They find that an increase in the real federal funds rate of 1 percentage point is associated with a statistically significant fall in the loan-risk measure of 0.052 (table IV, column 4). But the effect is economically insignificant. The standard deviation of the loan-risk measure is 0.85 (table I, panel B), so the effect of a 1 percentage point higher real federal funds rate is only $0.052/0.85 = 6.1\%$ of the standard deviation of the loan-risk measure. This means that the loan-risk measure is influenced mainly by factors other than the federal funds rate. This is hardly a risk-taking effect that could have any material effect on the probability or magnitude of a crisis. Furthermore, as the authors emphasize, their results are not well suited for answering whether the additional risk-taking of banks facing more accommodative monetary policy is *excessive* from a social-welfare standpoint.

But, given existing *empirical* estimates, a modest policy-rate increase would *barely cover the bottom of those cracks*, as indicated by figure 2.3. To fill the cracks, the policy-rate would have to be increased so much that it may kill the economy (Svensson, 2017a). As often, qualitative effects are not sufficient; estimates of the quantitative effects are necessary for a final assessment.

Also, Vítor is not impressed by Stein’s argument but turns it around:

[T]he fact that monetary policy “gets in all the cracks” of the financial system was seen as an advantage by Jeremy Stein. However, it can easily become a significant inconvenience if it creates an unnecessary recessionary episode or, when in a monetary union, a financial instability episode is not generalised across all countries (Constâncio, 2018b).

2.3.2 The Swedish experience

The recent experience in Sweden provides, first, a dramatic example of LAW and, second, an equally dramatic complete turnaround of policy.⁸ In June 2010, the forecasts for inflation and unemployment by the Riksbank for Sweden and by the FOMC for the US looked very similar. The inflation forecast was below 2% and the unemployment forecast was far above each central bank’s estimate of a long-run sustainable rate (Svensson, 2011b, figs. 1 and 2). With reference to those June 2010 FOMC forecasts, Bernanke (2010) concluded that “[g]iven the [FOMC’s] objectives, there would appear—all else being equal—to be a case for further action,” meaning a case for further easing of monetary policy. Indeed, at the time, the FOMC continued to keep the policy rate close to zero but started preparing QE2.

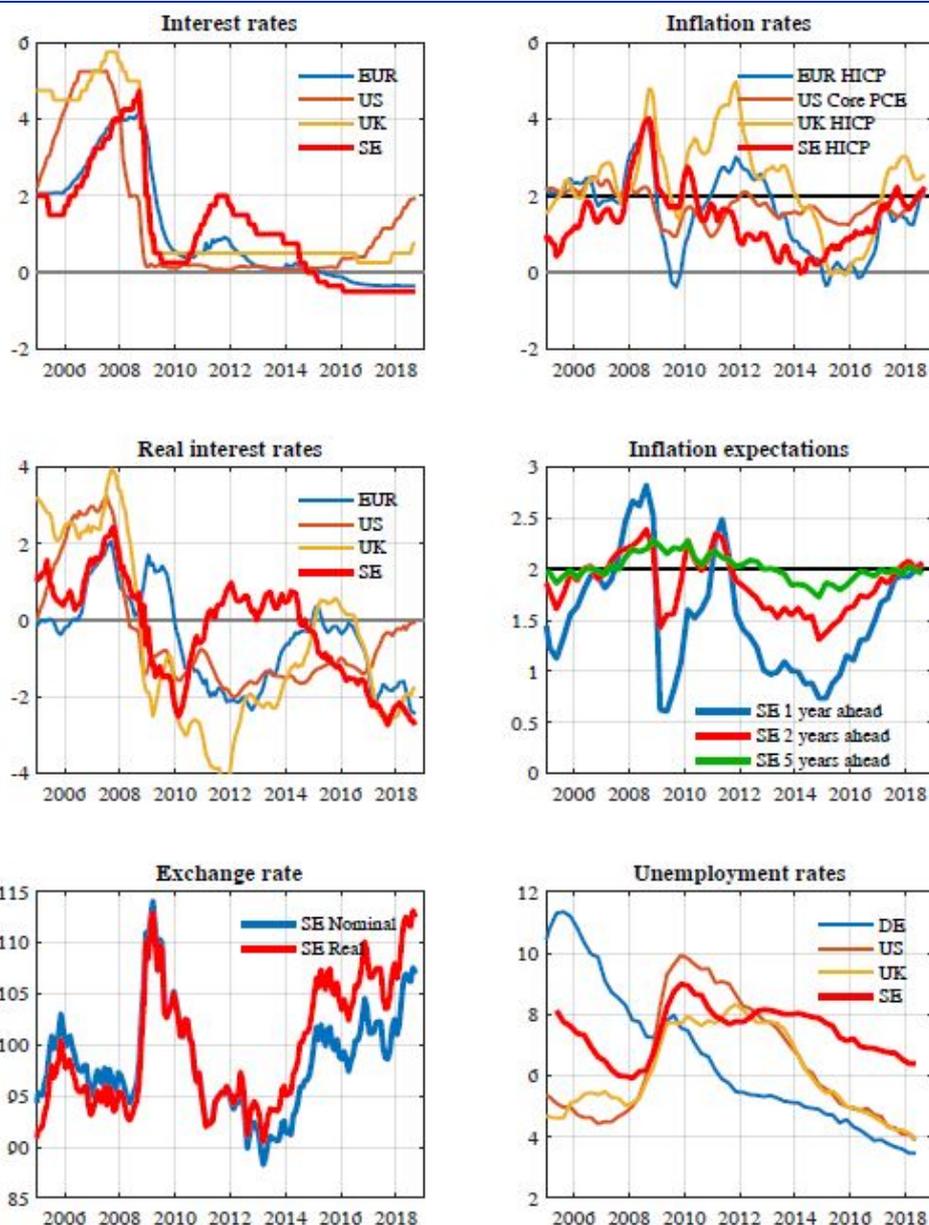
In contrast, in spite of the similar forecasts, the majority of the Riksbank’s executive board did not continue to keep the policy rate close to zero and did not prepare any QE. Instead it raised the policy rate rapidly from 0.25% in July 2010 to 2% in July 2011, citing concerns about housing prices and household debt.⁹

⁸ Turner (2017) provides a broad discussion of LAW with examples from several countries.

⁹ Full disclosure: As a Deputy Governor and Member of the Riksbank’s Executive Board at the time, I dissented against every single rate increase and thereafter in favor of larger rate decreases. The reasons are explained in Svensson (2010) and in more detail in the Riksbank’s attributed minutes from the policy meetings, for example, the June/July meeting 2010, Sveriges Riksbank (2010) (available in English at www.larseosvensson.se or www.riksbank.se). My lessons from six years of policymaking, ending in May 2013, are summarized in Svensson (2013).

Figure 2.4

Interest rates, inflation rates, and real interest rates for Sweden, the euro area (eonia rate), the UK and the US; inflation expectations (of money-market participants) and real exchange rates for Sweden; unemployment rates for Sweden, Germany, the UK, and the US during 2005-2018



Source: Thomson Reuters Datastream and TNS Sifo Prospera.

In figure 2.4, the top-left panel shows the policy rates for Sweden, the US, and the UK, and the eonia rate for the euro area. We see the dramatic rise of the Riksbank's policy rate starting in mid-2010. The top-right panel shows the inflation rates (measured by the core PCE index for the US and the HICP index for the other economies). Swedish inflation fell and reached zero in the beginning of 2014. The middle-left panel shows the corresponding real interest rates (measured as interest rates less inflation). The real interest rate rose dramatically in Sweden, creating a large real interest-rate

differential to the other economies. The bottom-left panel shows the real and nominal effective Swedish exchange rate. The krona depreciated much during the fall of 2008, which mitigated the effect of the crisis, but then appreciated as much during the tightening 2010- 2011. The middle-right panel shows the CPI inflation expectations of Swedish market participants for inflation one, two, and five years ahead. We see that inflation expectations fell with a lag when actual inflation fell. The bottom-right panel shows that the Swedish unemployment rate, which was falling after having peaked in early 2010, stabilized at a high level after the policy tightening, and then even rose. In Germany and the US, the unemployment rate steadily fell.¹⁰

The ECB also raised the policy rate, in April and July 2011, and has received some criticism for it (the top-left panel in figure 2.4 shows the eonia rate rather than the policy rate, so the distinct hikes are not clearly visible). Vítor discusses this and says:

... [C]oncerns were also voiced about the reduction in the ECB's balance sheet size beginning in 2012 and a possible link to the recession and low inflation period that followed. This view is compounded by the criticism of the two policy rate increases in April and July of 2011, taking it from 1% to 1.5%. This episode and the double dip in growth deserve therefore further comment. Those rate increases came on the wake of developments in the first half 2011, showing economic growth slightly above 2% and with inflation attaining 2.75% in the second quarter. We were also overly influenced by growth forecasts which turned out to be excessively optimistic.

...

With hindsight, it is now clear that increasing interest rates during this phase was premature. The economy weakened markedly after the summer, on the wake of the acute market pressures on the sovereign debt of Spain and Italy that led to a second round of interventions in the sovereign bond markets under the Securities Market Programme (SMP). The two consecutive rate hikes were quickly reversed in November and December of that same year. In view of the long lags of monetary policy effects, it is obvious that the quick succession of increases and reductions of policy rates cannot be responsible for the recessionary episode of that period. What really was responsible for the recession of 2012/2013 was the coordinated fiscal consolidation in which all member states engaged (Constâncio, 2018b).

However, whatever the ECB did pales in comparison with the Riksbank hikes. Also, the ECB's quickly reversed the hikes. Furthermore, it is sometimes overlooked that there is an important difference between the ECB and the Riksbank hikes. The ECB hikes were done when euro-area inflation was increasing (top-right panel). Although the nominal eonia rate rose somewhat, the real eonia rate stayed low and even fell in 2011 (middle-left panel). Indeed, the policy-rate hikes were consistent with continued quite expansionary policy, measured as the real eonia rate. In contrast, the Riksbank

¹⁰ Turner (2017, p. 17-20) compares the policies of Bank of England and Bank of Canada and notes that Bank of England conducted a tighter policy during late 2001 to mid 2004 because of worries of financial imbalances, which lead to a substantial appreciation of sterling against the dollar.

hikes were made when inflation fell, so the real policy rate rose dramatically, creating a large gap to the real rates of the euro area and the other economies and a strong appreciation of the krona.

In early 2014, the majority of the Riksbank executive board apparently realized that the situation was unsustainable, with inflation close to zero, inflation expectations falling below the target, and unemployment very high. The Riksbank policy was dramatically reversed. The policy rate was lowered and reached zero in October. In February 2015, the policy rate was moved into the negative range. The Riksbank then also initiated a program of asset purchases. The policy rate was further lowered and eventually reached minus 0.5% in February 2016 (top-left panel). Inflation rose back to close to the target of 2% (top-right panel), the real interest rate fell to below minus 2% (middle-left panel), the krona depreciated much (bottom-left panel), inflation expectations rose back to 2% (middle-right panel), and unemployment started to come down (bottom-right panel).

Apparently, monetary policy works according to the textbook in Sweden. Tightening appreciates the krona, reduces inflation, and increases unemployment, vice-versa for easing.¹¹

The dramatic tightening 2010-2011 was done without any supporting analysis of the efficacy of the policy rate as an instrument to contain the growth in household debt and housing prices and, in particular, without any explicit cost-benefit analysis. As noted in Svensson (2010), the available empirical work at the time indicated very high costs in terms of output and unemployment and small effects on debt and housing prices.¹²

Furthermore, there was no work indicating that the level of housing prices and household debt posed any risks that Finansinspektionen could not manage on its own, for instance with its LTV cap of 85% for new mortgages that Finansinspektionen introduced in the fall of 2010. Also, Finansinspektionen could assess risks connected to housing prices and household debt with considerable precision in its commendable report *The Swedish Mortgage Market*, which among other things included stress tests on households with new mortgages using microdata collected from the lending banks. The stress tests showed that households had substantial debt-service capacity and substantial resilience against shocks in the form of higher mortgage rates, falling housing prices, and income losses due to unemployment.¹³

¹¹ A very open economy with large export and import implies a strong exchange-rate channel in the transmission mechanism of monetary policy. High household debt with adjustable mortgage rates also implies a strong cash-flow channel that affects household consumption (Flodén et al., 2016).

¹² See, for example, Assenmacher-Wesche and Gerlach (2010), Bean et al. (2010), and Dokko et al. (2010) (working paper available in 2009). In particular, Riksbank staff members Claussen et al. (2011) showed, using Swedish data, that preventing housing prices from increasing above trend 2004-2010 would have required policy-rate increases of up to 5 percentage points. Inflation would have fallen up to 6 percentage points below the inflation target, and the accumulated GDP loss would have been about 12%.

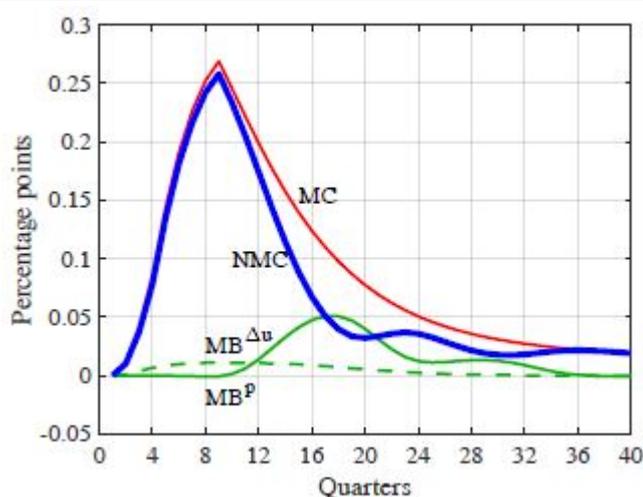
¹³ The 2010 report is only available in Swedish; from 2011 the mortgage market report is also available in English. The most recent is Finansinspektionen (2018b).

2.3.3 Cost-benefit analysis of LAW

This Swedish experience certainly stimulated my own interest in a cost-benefit analysis of LAW. In Svensson (2017a), the marginal costs and benefits of LAW are assessed. LAW is specified as increasing the policy rate above what is justified by standard flexible inflation targeting that disregards the risk of a financial crisis. LAW has a *first* cost, in terms of a weaker economy with lower inflation and higher unemployment, if no crisis occurs. Importantly, LAW also has a *second* cost, a cost that arises if a crisis occurs. This is because the cost of a crisis of a given magnitude is larger if the economy initially is weaker due to LAW. This second cost turns out to be the main cost of LAW. It has been neglected by previous literature (including my own previous work).

Figure 2.5

Marginal cost (MC), marginal benefits from a lower probability (MB^P) and smaller magnitude ($MB^{\Delta u}$) of a crisis, and net marginal cost (NMC); permanent policy-rate effect on real debt



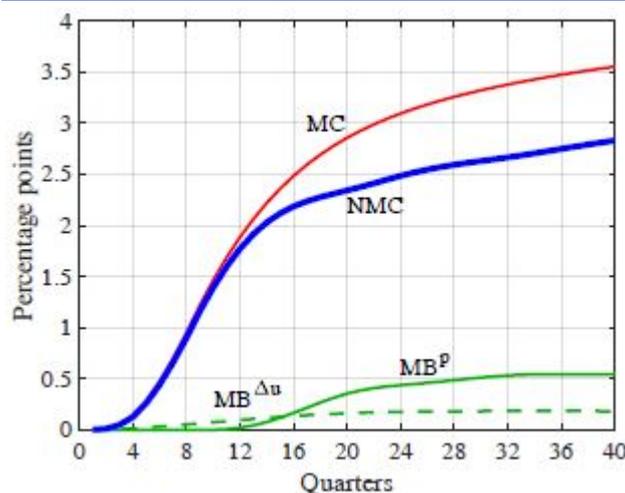
Source: Svensson (2017a).

LAW has possible benefits in the form of a lower probability or smaller magnitude of a crisis. However, for existing empirical estimates, the policy-rate effect on the probability and magnitude is much too small to prevent the marginal costs from exceeding the marginal benefits by a substantial margin. Figure 2.5 shows the marginal cost, the marginal benefits from a lower probability and a smaller magnitude of crisis, and the net marginal cost in future quarters from LAW in form of a 1 percentage point higher policy rate during quarters 1-4 than what is optimal when the possibility of a financial crisis is disregarded. Figure 2.6 shows the cumulative marginal costs and benefits. We see that the cumulative marginal cost exceeds the marginal benefits by a large margin. Furthermore, as in figure 2.3, the case is tilted in favor of LAW by assuming that the policy-rate (unrealistically) has a permanent effect on real debt. With the more realistic assumption of no long-run policy-rate effect on real debt, the marginal benefits are even smaller.

The result that the costs exceed the benefits is quite robust to alternative assumptions. To get to break-even, that is, equality between the marginal cost and the marginal benefit, the policy-rate effects need to be 5-40 standard errors larger than the benchmark empirical estimates.^{14 15}

Figure 2.6

Cumulative marginal cost, marginal benefits from a lower probability and smaller magnitude of a crisis, and net marginal cost; permanent policy-rate effect on real debt



Source: Svensson (2017a).

A recent IMF staff paper (IMF, 2015) presents a thorough analysis and survey of the pros and cons of LAW and finds that except in the most exceptional circumstances, costs outweigh benefits. It concludes that, “[b]ased on current knowledge, the case for leaning against the wind is limited, as in most circumstances costs outweigh benefits.” The IMF’s recent extensive study of flexible inflation targeting Adrian et al. (2018) reaches the same conclusion. Former Federal Reserve Board Chair Ben Bernanke and Bank Presidents Charles Evans and John Williams have previously reached similar conclusions.¹⁶ The FOMC has also reached a similar conclusion.¹⁷ The

¹⁴ As discussed in some detail in Svensson (2017a, section 5), Svensson (2017b), if the second cost of LAW is neglected, as in previous work and in recent papers by Filardo and Rungcharoenkitkul (2016) and Gourio et al. (2017), then, for zero LAW, the marginal cost of LAW is zero. If the marginal benefit is positive, then some positive LAW is optimal. However, the marginal cost rises rather quickly, so the optimal LAW is quite small, corresponding to a small increase in the policy rate and, as in Gourio et al. (2017), a small reduction of only a few basis points of the annual probability of a crisis start. A similar result has previously been reported by Ajello et al. (2016).

¹⁵ That the policy-rate effects need to be 5-40 standard errors larger than existing benchmark empirical estimates to get to break-even contradicts Adrian and Liang (2018), who have argued that reasonable alternative assumptions about the policy-rate effect on the probability or magnitude of a crisis would overturn the result (Svensson, 2017a, section 5).

¹⁶ “As academics (and former academics) like to say, more research on this issue is needed. But the early returns don’t favor the idea that central banks should significantly change their rate-setting policies to mitigate risks to financial stability” (Bernanke, 2015). “Indeed, any decision to instead rely on more-restrictive interest rate policies to achieve financial stability at the expense of poorer macroeconomic outcomes must pass a cost-benefit test. And such a test would have to clearly illustrate that the adverse economic outcomes from more-restrictive interest rate policies would be better and more acceptable to society than the outcomes that can be achieved by using enhanced supervisory tools alone to address financial stability risks. I have yet to see this argued convincingly” (Evans, 2014). “[M]onetary policy is poorly suited for dealing with financial stability, even as a last resort” (Williams, 2015).

Independent Review of BIS Research (Allen, Bean, and Gregorio, 2016) has noted that:

... so far the [BIS] argument for LAW seems to have cut relatively little ice with those actually responsible for setting monetary policy. In part, that is because of the lack of convincing evidence that the expected benefits outweigh the expected costs.

... in some cases the research programme appeared somewhat one-eyed. [Of 9 projects on financial stability and monetary policy] the first and (to some extent) the fifth seem motivated primarily by a desire to overturn Svensson's [2017a] conclusion on the inadvisability of LAW.

... the research effort ... seems excessively focussed on building the case for LAW, rather than also investigating the scope for other policy actions to address financial stability risks." [Reference updated.]

The Riksbank does also now seem to conclude that the costs of LAW exceed the benefits.¹⁸

Furthermore, Vítor has strongly supported the conclusion that the costs of monetary policy LAW for financial-stability purposes exceeds the benefits (Constâncio, 2017a,b, 2018b). In particular, in a recent speech, Vítor presents an ECB staff update of my cost-benefit analysis for the euro area (Constâncio, 2018a). His figure 1 is reproduced in figure 2.7. He shows that also in the euro area, the cumulative marginal cost exceeds the cumulative marginal benefits with a substantial margin, although a somewhat smaller margin than the one I got (in the benchmark case when I did not tilt the case in favor of LAW by assuming that monetary policy unrealistically has a permanent effect on real debt as in figures 2.5-2.6). Furthermore, Vítor shows that, for macroprudential policy, the cumulative marginal benefits exceed the cumulative marginal cost, especially when macroprudential takes into account an ECB measure of the "financial cycle."

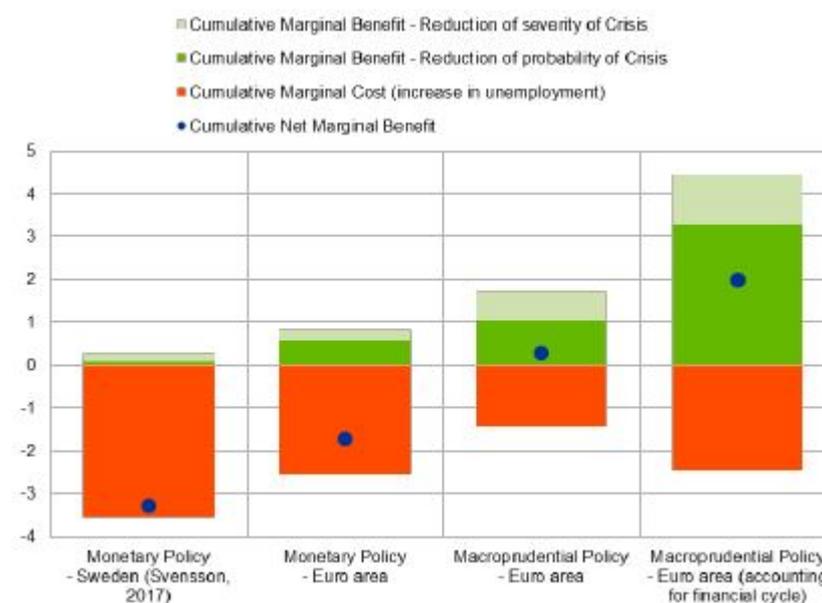
¹⁷ "Most participants judged that the benefits of using monetary policy to address threats to financial stability would typically be outweighed by the costs ... ; some also noted that the benefits are highly uncertain" (FOMC, 2016).

¹⁸ "It is not likely that small increases in the repo rate would have any tangible effects on household indebtedness. A large increase in the repo rate could certainly slow down the buildup of debts but would also lead to higher unemployment, a much stronger krona and lower inflation. Other measures more specifically aimed at reducing the risks associated with household debt have less negative effects on the economy as a whole" (Sveriges Riksbank, 2017, p. 13).

Figure 2.7

Net marginal costs of “leaning against the wind”: Monetary policy vs. macroprudential policy (Figure 1 in Constâncio, 2018b)

(cumulative impact after 40 quarters; in percentage points of the loss function)



Sources: Svensson (2017), Darracq Parïès, Kok and Rodríguez Palenzuela (2011) and ECB calculations.

Note: The monetary policy measure is a 1 pp. increase of the policy rate over 4 quarters. The macroprudential measure considered here is a 1 pp. increase of the capital buffer requirement. The “financial cycle” variable is a composite measure of four indicators including total credit growth, house price growth, interest service burden and debt-to-income ratio.

2.4 Conclusions on monetary policy

In the quite selective discussion above, I have suggested that the monetary policy strategy of the ECB can be further clarified by modifying the quantitative definition of price stability to correspond to a symmetric inflation target of 2%. I have also suggested that the objective the ECB monetary policy can be expressed as price stability and full employment, without prejudice to the objective of price stability. Possible alternatives to “full employment” are “maximum sustainable employment,” “minimum sustainable unemployment,” “maximum sustainable output,” “full resource utilization,” “real stability,” etc., which with the appropriate explanation will have for practical purposes the same meaning.

Furthermore, I have suggested that the expression “without prejudice to the objective of price stability” is clarified to mean that average inflation over a somewhat longer period, for example five years, shall normally be close to the symmetric inflation target.

Figure 2.1 above shows that past monetary policy of the ECB had done relatively well regarding price stability in the light of these suggestions. As mentioned, keeping 5-year average inflation close to the inflation target is a moderate step towards price-level targeting. If this moderate step towards price-level targeting works well, one may want to take further steps towards price-level targeting. It is interesting, as

shown in figure 2.2, that the ECB ex-post has been a pretty successful price-level targeter except in the last few years.

Above, I have also suggested that flexible inflation targeting can be further developed in doing more explicit forecast targeting, including the publication and justification of forecasts of the target variables and, importantly, of the policy rate and any other instrument. Thus, central banks would then not only publish forecasts of inflation and unemployment or output, but also of the policy rate. Publishing policy-maker forecasts poses some special problems when there are many members in the monetary policy committee, as in the ECB's Governing Council and the Federal Reserve's FOMC. However, the FOMC has shown in its "Summary of Economic Projections" that it is possible to publish at least a summary and illustration of policy-makers forecasts. I would think something similar would also be possible for the ECB's Governing Council. Still, a joint policymaker policy-rate path and forecast of target variables is preferred, if possible.

I have also suggested that the ECB staff forecast could include forecasts for other policy-rate paths than that corresponding to market expectations. This would allow for staff forecasts that "look good" in the sense of achieving the ECB's objectives but also provide a menu of alternative policy choices.

Given the strong and increasing evidence, one might think that the debate about whether monetary policy should have financial stability as an objective and whether monetary policy should undertake LAW for financial-stability purposes would be over by now, but I am afraid that it will stay for a bit longer.

The discussion above has not dealt with a low neutral interest rate and the lower bound for the policy rate. The low neutral interest rate and the likelihood that the neutral interest rate will stay low for a relatively long period means—everything else equal—that the effective lower bound of the policy may more often prevent monetary policy from being sufficiently expansionary when negative shocks occur. Raising the inflation target and price-level targeting have been suggested as possible modifications to make the effective lower bound less restrictive.

However, the effective lower bound is lower than we thought before. It is not zero but negative, and it is not hard but soft. Also, central banks have developed unconventional policy instruments as substitutes for and complements to low policy rates. This means that there is still room to make monetary policy quite expansionary. Furthermore, one needs a high bar to raise a credible and established inflation target, especially because this may cause expectations of further adjustments in the future and thus reduce the target's credibility. My view is that there is not yet sufficient evidence and experience to justify raising current inflation targets. But future evidence and experience may provide such justification.

One result of the experience with the lower bound is a renewed interest in price-level targeting. In particular, a temporary and state-contingent price-level target have been proposed when the lower bound and related circumstances prevent monetary policy from being sufficiently expansionary (Evans, 2010; Bernanke, 2017). I find the arguments in favor of this quite convincing and believe that plans to use such

temporary price-level targets should be prepared for situation in which they may be needed.¹⁹ In particular, if some weight is regularly placed on keeping 5-year average inflation close to the target, this may make the transition to a temporary price-level target when needed easier and smoother. A target for 5-year average inflation is quite similar to a 5-year price-level target path.

3 Macroprudential policy

Macroprudential policy is a quite new policy. There are only a few years of experience yet. It is desirable that macroprudential policy can become as established a policy as monetary policy, with clear objectives, a set of sufficient instruments, and a good governance setup, including mechanisms to evaluate the policy and hold policymakers accountable for achieving the objectives.

3.1 Different and separate

As discuss in Svensson (2018c), at a closer look monetary policy and macroprudential policy are quite different policies. They have different suitable goals: price stability and full employment (real stability) for monetary policy and financial stability for macroprudential policy. They have different suitable instruments, and in many countries different responsible authorities. In particular, they work through very different transmission mechanisms. The transmission mechanism of monetary policy to achieve price stability and real stability and the transmission mechanism of macroprudential policy to achieve sufficient resilience of the financial system are quite different.²⁰

Still, there is some interaction between the policies. Monetary policy has a strong and systematic effect on price stability and real stability and normally a small, indirect, and unsystematic effect on financial stability. Macroprudential policy has a strong and systematic effect on financial stability and normally a small, indirect, and unsystematic effect on inflation and resource utilization. Given this, the conditions are fulfilled for the policies being successfully conducted separately, as in a Nash equilibrium, with each policy focused on achieving its goals while taking into account the conduct and effects

¹⁹ A temporary price-level target is one component of the Foolproof Way of Escaping from a Liquidity Trap which I suggested for Japan many years ago (a second component is a currency depreciation and a temporary exchange-rate peg and the third and final component is an exit strategy, namely to return to normal policy making when the price-level target has been reached (Svensson, 2003). Interestingly, the Czech National Bank has successfully used a variant of the Foolproof Way in dealing with the lower bound, namely a variant using a depreciation and a currency floor to reach its inflation target rather than a temporary price-level target (Clinton et al., 2017).

²⁰ In contrast, (Borio, 2014, p. 41) has suggested that monetary policy and macroprudential policy may cause a tension by being employed in opposite directions: “it is a bit like driving by pressing on the accelerator and brake simultaneously—not exactly what is normally recommended.” This use of a driving metaphor presumes that monetary and macroprudential policies work through very similar mechanisms. But I find this metaphor quite misleading. Staying within driving metaphors, I would suggest that a more relevant metaphor is that monetary policy operates the accelerator and the brake to achieve a steady optimal speed of the car. This means monetary policy presses on the accelerator when the road is uphill and on the brake when it is downhill. Macroprudential policy makes sure that the safety belts and airbags are in good condition, that the safety belts are being used, and that the airbags are activated. The policies are normally more or less orthogonal.

of the other policy. The interaction between monetary policy and macroprudential policy is arguably weaker and less systematic than the interaction between monetary policy and fiscal policy; this arguably makes the argument for the separation of monetary policy and macroprudential policy stronger than for the separation of monetary policy and fiscal policy.²¹

There is thus a strong case for separation of monetary and macroprudential policies (Bean, 2014; Broadbent, 2018; Constâncio, 2018a; Kohn, 2015; Svensson, 2018c). In particular, Vítor says:

My own view is that the two policies are different and should remain separate, ... implying that monetary policy should not respond to financial stability concerns. The new main justifying argument for this stance is that macroprudential policy is now available and is the most effective tool for safeguarding financial stability. This is because policy instruments directly address excessive leverage behaviour and do not have the same cost or negative spillovers of a “leaning against the wind” policy (Constâncio, 2018a).

3.1.1 Separate decision bodies

The separation of monetary and macroprudential policies is strengthened if there are two separate decision bodies. One well-known example of separate decision bodies is the UK one. The Bank of England has responsibility for both monetary and macroprudential policies, but there are two decision-making bodies, the MPC in charge of monetary policy and the FPC in charge of macroprudential policy. Each committee has its goals and its instruments, and each is accountable for achieving its goals. Furthermore, each policy is conducted in an open and transparent way, and there is some overlap of members in the two committees. This makes each committee fully informed about the conduct and effects of the other committee’s policy.

Another, probably less known example is the Swedish one. In August 2013, the Swedish government announced a new strengthened framework for financial stability in Sweden and clarified the roles and responsibilities of the relevant authorities. Finansinspektionen was assigned the main responsibility for financial stability and received control of all macroprudential instruments, including the countercyclical capital buffer. The Riksbank thus has no macroprudential instruments (except communication) for crisis prevention, only lending of last resort for crisis management. Because Finansinspektionen is an authority under the government, the government has the ultimate responsibility and accountability for financial stability, including any welfare, intergenerational, and other distributional consequences and tradeoffs.²²

²¹ One cannot exclude that the rare situation could occur that monetary policy for some reason poses a threat to financial stability that the macroprudential authority cannot manage with its available instruments. Then some coordination is warranted. How this can be done is discussed in Svensson (2018c, section 7).

²² In Sweden, the Riksbank is an authority under the Swedish Parliament, not under the government.

Monetary and macroprudential policies in Sweden are normally conducted in a transparent and open way, making it easy for the Riksbank and Finansinspektionen to be fully informed about the conduct and effects of the other authority's policy. Furthermore, the government has created a new Financial Stability Council, with the minister of financial markets from the Ministry of Finance as chair and the director general of Finansinspektionen and the Swedish National Debt Office (which is the national bank-resolution authority in Sweden) and the governor of the Riksbank as members.

The Council meets regularly and is a forum for exchange of information and discussion of financial-stability issues, including reports commissioned by the Council from workgroups formed by staff of the authorities represented in the Council. The Council has no decision power; this power rests with the authorities represented in the Council. The Council creates a forum where the authorities can exchange information about their respective views and policies relating to financial stability. In a crisis, the Council will lead and coordinate the crisis management.

Conducting monetary policy and macroprudential policy separately has the considerable advantage that each policy, with its separate goals and instruments, becomes more distinct, more transparent, and easier to evaluate. This in turn makes it easier to hold the decision-making body for each policy accountable for achieving its goals. This creates stronger incentives for each policy to achieve its goals and thereby makes it more likely that the goals are achieved. As is the case for monetary policy and fiscal policy, transparency and accountability aspects provide strong additional arguments for the separation of monetary policy and macroprudential policy.

3.2 The definition of financial stability

For macroprudential policy, the primary goal is financial stability. The definition of financial stability is not as clear and obvious as the definition of price stability and full employment. One definition of financial stability is that the financial system can fulfill its three main functions (transforming saving into financing, allowing risk management, and transmitting payments) with sufficient resilience to disturbances that threaten these functions. The crucial part of the definition is sufficient resilience. In the future, there will unavoidably be disturbances and shocks to the financial system, very likely from unanticipated directions and of unanticipated kinds. The crucial thing is then that there is sufficient resilience to disturbances, so as to limit the probability and magnitude of financial crises.²³

According to ESRB (2013), “the ultimate objective of macro-prudential policy is to contribute to the safeguard of the stability of the financial system as a whole, including

²³ This specification of the goal of macroprudential policy is consistent with the definition in IMF (2013, p. 6) of macroprudential policy as “... the use of primarily prudential tools to limit systemic risk. A central element in this definition is the notion of systemic risk—the risk of disruptions to the provision of financial services that is caused by an impairment of all or parts of the financial system, and can cause serious negative consequences for the real economy.” Everything else equal, more resilience means less systemic risk.

by strengthening the resilience of the financial system and decreasing the build-up of systemic risks, thereby ensuring a sustainable contribution of the financial sector to economic growth.”

The resilience of the financial system needs to be considered relatively broadly. It is not only the resilience of lenders, banks and other financial intermediaries, that matters. The resilience of borrowers, including households and firms, for example in real estate and construction, may also matter.

Importantly, there may be a trade-off between financial stability and resilience on one hand and efficiency, growth, and prosperity on the other. We clearly do not want the stability of the graveyard. Regulation has benefits to the extent that it remedies negative effects of some market failures, such as externalities, but it may also have costs in terms of less competition, less efficient resource allocation, and so on. Regulation may also have income- and wealth-distribution effects, including intergenerational effects. This means that macroprudential policy needs to have a secondary goal. For example, the Bank of England’s Financial Policy Committee has a secondary objective identical to that of its Monetary Policy Committee, namely of “supporting the economic policy of Her Majesty’s Government, including its objectives for growth and employment” (Hammond, 2017). More generally, macroprudential policy actions need to be supported by a cost-benefit analysis, showing that the benefits exceed the costs.²⁴

The Swedish government has long specified that the objective of Finansinspektionen is:

to ensure that the financial system is stable and characterised by a high level of confidence and has smoothly functioning markets that meet the needs of households and corporations for financial services, and provides comprehensive protection for consumers (Swedish Ministry of Finance, 2017).

However, in December 2013, the government added a clause to the objective, which instructs Finansinspektionen:

to take measures to counteract financial imbalances with a view to stabilising the credit market.

This is in my mind an unfortunate addition, a kind of rubber paragraph in which it is not clear what is meant by “financial imbalances” and “stabilising the credit market.” It is problematic when an objective is ambiguous and open to interpretation.²⁵ In particular, it is strange that the government did not follow one of the ESRB (2013) related recommendations on intermediate objectives that was issued in April 2013, namely (ESRB, 2013, p. 4, italics added):

to mitigate and prevent excessive credit growth and leverage.

²⁴ As noted above, Constâncio (2018a, figure 1), reproduced in figure 2.7, provides an example of a cost-benefit analysis of macroprudential policy.

²⁵ I have yet to see a definition of “financial imbalances.” And what is a “financial balance”?

The restriction to “excessive” credit growth and leverage is important and makes it clear that one has to identify growth and leverage that are excessive from a social-welfare point of view. The ESRB also emphasizes the importance of identifying intermediate objectives on the basis of specific market failures and mapping these into intermediate objectives (ESRB, 2013, p. 7 and table 1):

Identifying intermediate objectives on the basis of specific market failures documented in the literature may allow for a clearer classification of macro-prudential instruments, ensure an economic base for the calibration and use of those instruments and foster the accountability of macro-prudential authorities. ... To develop a comprehensive view on intermediate objectives, this [Recommendation] uses the literature to identify the market failures relevant for macro-prudential policy and then maps them to individual objectives.

3.3 Good and bad credit growth

One important issue in macroprudential policy is how to deal with credit booms and credit growth. A difficulty is that all credit booms are not bad. There are good credit booms, and there are bad credit booms. Depending on the sample, only about a third or a quarter of credit booms end in a financial crisis (Dell’Ariccia et al., 2012; Richter et al., 2018). Distinguishing between them is not easy. There is a trade-off between, on one hand, failing to intervene to stop bad booms in time to avoid potentially severe costs to the economy and, on the other hand, being overly activist and intervening to stop a good boom and this way cause potentially severe costs for the economy. Again, one does not want the stability of the graveyard.

Households’ access to credit and borrowing allows efficient consumption smoothing and the build-up of liquidity and more efficient asset portfolios. It allows households to overcome temporary difficult times and maintain their consumption and standard of living. It therefore increases households’ resilience. It allows household with income but without wealth to borrow and purchase a home or other durables, such as cars, and start using them without first saving for a long period. If there is no functioning rental market, as is the case in Swedish major cities due to rent control, there is little alternative to owner-occupied housing. Then borrowing is necessary for households without sufficient wealth. Good credit growth is then, for example, due to financial deepening with improved lending standards and improved mortgage products that increase access to credit for suitable borrowers. It may be due to rising incomes, sustained falls in interest rates, increased demand for owner-occupied housing, fundamentals-driven increases in housing prices, and other- wise explained and driven by sustained movements of fundamentals. In particular, good credit growth will fluctuate, sometimes be high, sometimes low, for good fundamental reasons. When good credit growth is high, it will appear “unsustainable,” but good credit growth will eventually adjust and become “sustainable.” In particular, good credit growth may exceed income growth and thus increase the debt-to-income ratio for many years.

Bad credit growth — “excessive” credit growth — is generally due to some market failure, for example, regarding households, the underestimation of the risks from low

lending standards and high loan-to-value ratios and lending to borrowers with insufficient debt-service capacity or insufficient resilience to disturbances in the form of interest-rate increases, housing-price falls, and income losses. It may be due to over-optimism, speculation in unrealistic future housing-price increases, overvaluation of housing, housing equity withdrawal (HEW) (also called mortgage equity withdrawal) to finance unsustainable overconsumption, and so on.

The point is that good macroprudential policy requires considerable and detailed analysis to distinguish between good and bad credit growth. In particular, the causes of the credit growth and the use of the credit need to be clarified to assess any associated risks. Then the macroprudential authority can react with targeted policies to mitigate and prevent bad credit growth and to allow good credit growth to run its course. Generally, regulation requires an identified market failure as well as a supporting cost-benefit analysis. Even if there is a specific market failure there, regulation may sometimes make things worse. Therefore, regulation needs the support of a thorough cost-benefit analysis.

Unfortunately, macroprudential policy in Sweden is currently, with reference to the rubber paragraph mentioned on page 27, aiming to prevent the growth of household debt without Finansinspektionen or any other authority having been able to show that the credit growth is bad—“excessive”—rather than good. Indeed, at a closer look, the information available indicates that it is good credit growth explained by movements in fundamentals, and that preventing this growth of household debt with the methods used has severe welfare costs.

Because distinguishing between good and bad credit growth in macroprudential policy is both important and difficult, and because the costs of making mistakes is high, this Swedish example may be of some general interest and imply some lessons for macroprudential policy in other countries. I will therefore extend a bit on it here.

3.4 A possible problem with Swedish macroprudential policy

There are many good things with Swedish macroprudential policy. As mentioned above, the government has introduced a framework for financial stability with a clear separation of monetary policy and macroprudential policy and with Finansinspektionen in charge of and accountable for macroprudential policy. Furthermore, Finansinspektionen has been quite active in strengthening the resilience of the Swedish financial system. It has also thoroughly monitored bank's lending standards for mortgages and the households' debt-service capacity and resilience to disturbances.

Finansinspektionen has taken a series of actions to strengthen the resilience of the financial system. It introduced an LTV cap of 85% for mortgages in October 2010. It raised the risk-weight floor for mortgages first in May 2013 to 15% and then in September 2014 to 25%, which is quite high given historical credit losses and the fact that mortgages are full recourse. It introduced the Basel III LCR regulation in January 2014. It introduced a Basel Pillar 2 add-on of 2% in September 2016 and a systemic buffer of 3% in January 2015 for the four largest banks. The Countercyclical

Buffer was activated at level 1% in September 2015, raised to 1,5% in June 2016, and then to 2% in March 2017. The current capital requirements for the four largest and systemically important banks stand at 24% of risk-weighted assets. Their actual capital is 28% of risk-weighted assets (22% of risk-weighted assets for common equity tier 1 capital). Swedish banks are among the best capitalized in Europe and are very resilient in severe stress tests (Finansinspektionen, 2017c).²⁶

Regarding households and household debt, Finansinspektionen introduced a special annual mortgage market report in February 2010. The report uses microdata on new borrowers collected from the banks and provides an extensive and detailed report of the volume and distribution of household debt. In particular, it reports the results of stress tests of the households, to assess the debt-servicing capacity and resilience to disturbances of households. This way, Finansinspektionen is able to thoroughly monitor the development of households' debt-service capacity and resilience. Already in 2010, the debt-service capacity was good, as was the resilience to disturbances in the form of housing-price falls, interest-rate increases, and income losses from unemployment increases. Since then, the debt-service capacity and resilience to disturbances have improved steadily even further. In addition, the average LTV ratio in 2017 was only 63% for new mortgages and only 55% for the total stock of mortgages (Finansinspektionen, 2018b).

3.4.1 Housing prices and household debt and assets²⁷

One reason for the introduction of the mortgage market report is that housing prices and household debt have been increasing. Demand for owner-occupied housing has been growing, due to a downward trend in mortgage rates, increases in disposable income, urbanization and migration to the major cities, and other structural reasons. Also, after the election outcome in 2006, the new government fulfilled its election promise to lower the property tax, which was effective January 2008. Due to rent control there is no functioning rental market in the major cities and all new demand has to be directed towards owner-occupied housing. For several reasons, the supply of housing has not kept up with the increasing demand. The reasons include restrictions on land use, building regulations, and institutional restrictions on regional planning. Under these circumstances it is not strange if housing prices and household debt increases.

Figure 3.1 shows Swedish housing prices, Stockholm apartment prices, disposable income, and mortgage rates for 3-month, 5-year, and 10-year fixation periods.²⁸ All variables are indexed to 100 for June 2008, when the lower property tax had been incorporated in prices. During the last 10 years, disposable income has risen about

²⁶ The Riksbank has sometimes accused Finansinspektionen of having an "inaction bias," but there is clearly no ground for such an accusation.

²⁷ Whether Swedish housing prices and household debt is too high or not relative to fundamentals is discussed in further detail in Svensson (2018b).

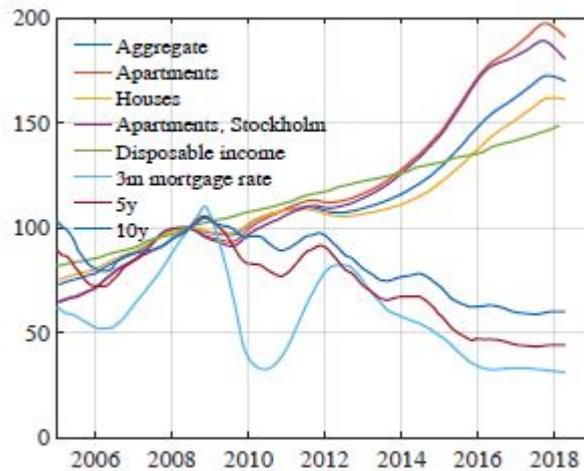
²⁸ Throughout this paper, "Stockholm" refers to Stockholm Municipality, which is considerably larger than Stockholm's inner city.

50%. Over the same period, housing prices have risen more than disposable income. We also see that mortgage rates have fallen substantially.

Figure 3.1

Swedish housing and Stockholm apartment prices, disposable income, and mortgage rates

(12-month trailing moving averages, index = 100 for June 2008)



Source: Thomson Reuters Datastream.

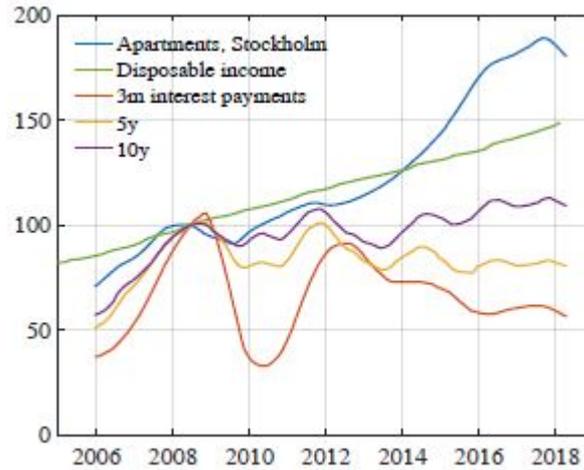
Figure 3.2 shows Stockholm apartment prices and has also replaced the mortgage rates by interest payments for Stockholm apartments. They are calculated as the product of mortgage rates and the prices of Stockholm apartments and correspond to interest payments for new mortgages at a constant LTV ratio, for instance the LTV cap of 85%. They are also indexed to 100 for June 2008. Relative to disposable income, mortgage rates have fallen more than housing prices have risen. Therefore interest payments have fallen substantially relative to disposable income. This is the case also for 10-year mortgage rates, which less than a term premium can be seen as expectations of the average short mortgage rate over the next 10 years. And over the next 10 years, disposable income will perhaps rise another 40-50%, further reducing the interest-payment-to-income ratio.²⁹ Given this, it is difficult to see that housing in Sweden and Stockholm would be overvalued (at least overvalued relative to the valuation in 2008).

²⁹ With 2% real growth and 2% inflation, disposable income should grow by 4%, which results in an increase of 48% in 10 years.

Figure 3.2

Stockholm apartment prices, disposable income, and interest payments for Stockholm apartments

(12-month moving averages, index = 100 for June 2008)



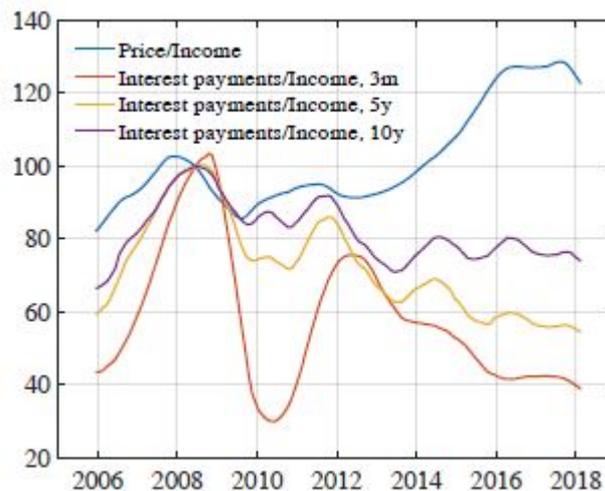
Source: Thomson Reuters Datastream.

Figure 3.3 shows the corresponding price-to-income ratios and interest-payment-to-income ratios for Stockholm apartments, the price and the interest payments for Stockholm apartments in figure 3.2 divided by the disposable income. The ratios are indexed to 100 in June 2008.

Figure 3.3

Price-to-income and interest-payment-to-income ratios for Stockholm apartments

(3-month, 5-year, and 10-year mortgage rates. 12-month moving averages, index = 100 for June 2008)



Source: Thomson Reuters Datastream.

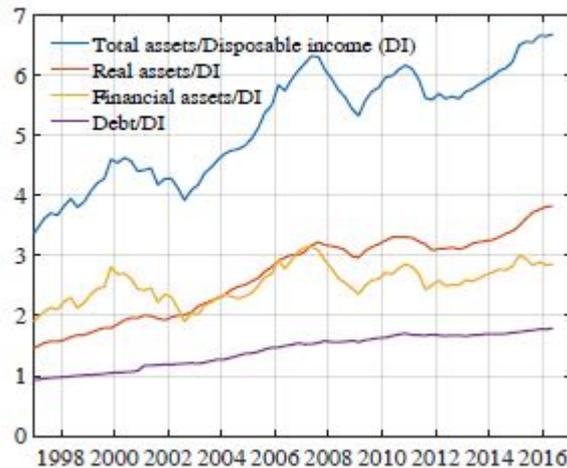
It is common to refer to the price-to-income ratio as an indicator of a whether housing is over- or undervalued. But this involves the well-known but very common mistake of comparing stocks to flows, the housing price being a stock variable and income being

a flow variable. The correct comparison is stock to stock, as in LTV ratios, or flows to flows, as in debt-service-to-income ratios.

The interest-payment-to-income ratio is a much more relevant measure of over- or undervaluation than the price-to-income ratio. The interest payment as calculated here, interest rate times price, can be seen as a simple capital-cost measure of housing, a simple user-cost measure of housing, or a simple debt-service measure of housing for constant LTVs.³⁰ The price-to-income and interest-payment-to-income ratios vary together only when mortgage rates are constant. But mortgage rates are normally not constant, and when they vary the interest-cost-to-income is the more relevant indicator. And according to it, Swedish housing prices are hardly overvalued (at least not compared with the valuation in 2008).³¹

When housing prices increase faster than disposable income, it is not strange that also household debt increases faster than income. Figure 3.4 shows that households' debt had increased to about 1.8 times disposable income in 2016. Households' real and financial assets had also increased. Real assets (owner-occupied housing and second homes) had increased to about 3.8 times disposable income, financial assets to about 2.9 times disposable income, and total assets (excluding households' claims on collective pensions and insurance) to about 6.7 times disposable income.

Figure 3.4
Swedish household assets and debt, ratio to disposable income



Source: Sveriges Riksbank (2016, appendix, figure A27).

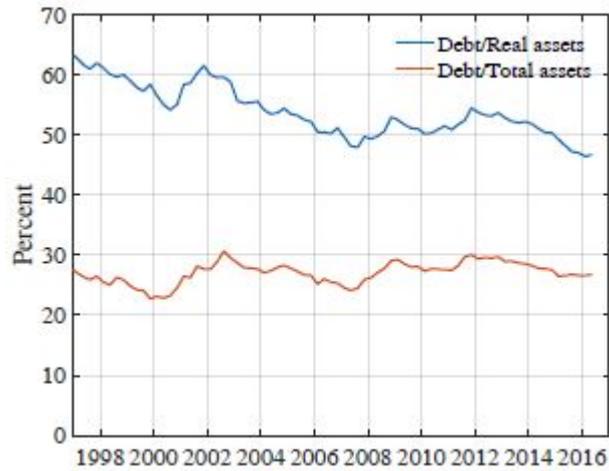
Notes: Total assets exclude collective pensions and insurance (which may amount to 1.5-1.7 times disposable income). Real assets refer to single-family houses, tenant-owned apartments, and second homes. Financial assets refer mainly to cash, bank deposits, bonds, mutual funds and shares.

³⁰ For households that have Cobb-Douglas preferences for housing services, have access to credit and are not liquidity constrained, and face a frictionless housing market, the correctly calculated user-cost of housing, the implied rent, would be a constant fraction of their total consumption. If their total consumption is a relatively constant share of their (after-tax) income, the user-cost-to-income ratio would be relatively constant.

³¹ Svensson (2018b) reaches the same conclusion by examining the more relevant user-cost-to-income ratios.

Figure 3.5 shows household debt-to-real-assets and debt-to-total assets ratios, appropriate stock to stock comparisons. We see that the debt-to-real-assets ratio, a measure of the housing leverage, shows a downward trend in the last 20 years toward less than 50%, whereas the debt-to-total assets ratio is approximately flat below 30%.

Figure 3.5
Swedish household debt to real assets and total assets



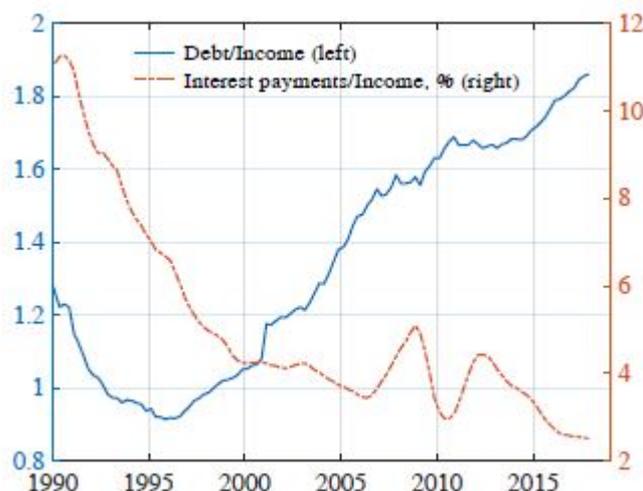
Source: Sveriges Riksbank (2016, appendix, figure A27).

Notes: Total assets exclude collective pensions and insurance (which may amount to 1.5-1.7 times disposable income). Real assets refer to single-family houses, tenant-owned apartments, and second homes. Financial assets refer mainly to cash, bank deposits, bonds, mutual funds and shares.

Finansinspektionen has expressed increasing concern about the growth of household debt relative to disposable income and tries to reduce the growth of household debt. However, the debt-to-income ratio is again a stock compared to a flow and thus a misleading indicator unless interest rates are constant. If interest rates vary, the debt-service-to-income ratio is a more relevant indicator. The blue line in figure 3.6 shows the debt-to-income ratio from figure 3.4 in a larger scale. The dashed-dotted red line shows the Swedish households' interest payment as a percent of disposable income. Even though the debt-to-income in figures 3.4 and 3.6 has increased, interest rates have fallen more, and the interest-to-income ratio in figure 3.6 is at a historic low.

Figure 3.6

Swedish household debt, ratio to disposable income (left), and interest payments, percent of disposable income (right)



Source: Sveriges Riksbank (2018, charts 2.1 and 2.6).
Note: Interest payments are after tax relief.

We can note that the visual impression of the increase in the debt-to-income ratio in the larger-scale figure 3.6 is more alarming than when the debt-to-income ratio is compared with the assets-to-income ratios in the smaller-scale figure 3.4. Swedish authorities tend to show the time series of the debt-to-income ratio much more often than the time series of the assets-to-income ratio. The time series of the debt-to-asset ratios are rarely shown.

3.4.2 Finansinspektionen's policy to reduce the growth and level of household debt

In order to reduce the growth of household debt, Finansinspektionen has implemented tighter lending standards by introducing amortization requirements. This substantially reduces borrowers' discretionary income (the excess of households' gross income over the sum of taxes, housing operating costs, interest and amortization payments, and benchmark living costs) and thereby affects how much banks lend to them. There is also increasing evidence that Finansinspektionen has encouraged banks to tighten lending standards in other ways, such as using a higher interest rate in the stress tests of borrowers in the banks' affordability assessments and applying new or lower existing bank-specific debt-to-income caps.³² By tightening lending standards in this way, Finansinspektionen has effectively reduced the supply of credit to households with moderate or low incomes and, wealth, a category which includes many young households and individuals.

³² For example, at the press conference presenting the mortgage market report 2018, it was clear that the director general of Finansinspektionen welcomed the tighter lending standards of the banks (Finansinspektionen, 2018a).

In June 2016, Finansinspektionen introduced a first amortization requirement for new mortgages with LTV ratios over 50%. For LTV ratios between 50% and 70%, at least 1% of the mortgage at origination should be amortized per year; for LTV ratios above 70%, at least 2% of the mortgage at origination. In March 2018 it introduced a second, “stricter” amortization requirement. For mortgages above 4.5 times gross income (income before taxes), an additional at least 1% should be amortized. It has also encouraged the banks to otherwise tighten their lending standards. The banks, perhaps perceiving an implicit threat of regulation if not obliging, have introduced or lowered their own debt-to-income caps, now typically 5-6 times gross income. The banks also apply a high interest rate in their discretionary income calculations, typically 7% (thus no less than 5.5 percentage points higher than current (May 2018) mortgage rates of about 1.5%).

Housing developers have reported that demand for new housing fell dramatically during the fall of 2017. Housing prices in the major cities fell between 5 and 10% from their peak in August 2017 to March 2018. Developers’ plans for new housing production have also fallen substantially.

It is pretty clear that the housing problem in Sweden is structural, namely increasing demand and insufficient supply. It is difficult to see that the right policy then is to reduce the supply of credit to households by tightening lending standards, especially because any resulting price fall then reduces the supply of new housing. The policy might be justified if Finansinspektionen could show that the growth of household debt is “excessive” or “bad” due to a market failure, loose lending standards, and a threat to financial stability, or even the result of exuberance and overoptimism. But Finansinspektionen has not provided any convincing case for this. Nor has it appropriately assessed the welfare cost of the policy and provided a thorough cost-benefit analysis.

3.4.3 Finansinspektionens arguments for an “elevated macroeconomic risk”³³

Importantly, the amortization requirements have *not* been justified by risks to financial stability. In contrast, Finansinspektionen says (Finansinspektionen, 2017a, p. 4, my translation from Swedish, italics added):

Finansinspektionen’s judgment is that the financial-stability risks associated with households’ debt are relatively small. This is because the mortgage holders generally have good possibilities to continue to pay their interest and amortization also if interest rates rise or incomes fall. The households have also on average good margins to manage a fall in housing prices. In addition, the Swedish banks are judged to have satisfactory capital buffers if credit losses nevertheless would materialize.

³³ Finansinspektionens arguments for an elevated macroeconomic risk is discussed in more detail in Svensson (2018a).

One can add that the fact that mortgages are full recourse reduces the risk of credit losses on mortgages. During the severe crisis in the 1990s in Sweden, of the loan losses in the four major bank groups at the height of the bank crisis in 1992, only 6% came from the household sector (Sveriges Riksbank, 1998, pp. 15-16). Furthermore, there is no buy-to-let to speak of.³⁴

Finansinspektionen has instead provided two other arguments for an “elevated macroeconomic risk” (Finansinspektionen, 2017a, p. 4, my translation, numbers, and italics):

Instead the risks presently associated with households’ debt mainly concern that highly indebted households may reduce their consumption substantially if (1) interest rates rise or (2) incomes fall, and that this might in turn reinforce a future economic downturn. ... *[H]igh and rising debt-to-income ratios among many borrowers therefore imply an elevated macroeconomic risk.*

The first argument, that highly indebted households may reduce their consumption substantially if interest rates rise, is factually true. But Finansinspektionen here disregards that interest rates are not exogenous but endogenous. In particular, with flexible exchange rates and inflation targeting, recessions are associated with *lower* interest rates, not higher ones.³⁵ Households with high debt ratios and variable mortgage rates then benefit *more* from interest-rate falls (their cash flows improve more) and their consumption would fall *less* than those with lower debt ratios. High debt and variable interest rates actually provide some general insurance against recessions for households. They work as an automatic stabilizer. Indeed, household debt and variable interest rates create a cash-flow channel in the transmission of monetary policy (Flodén et al., 2016; Hughson et al., 2016; Gustafsson et al., 2017). With a strong cash-flow channel, it is easier for the Riksbank to stabilize consumption, aggregate demand, and the business cycle (it can be done with less policy-rate movements). The risk of a recession would seem to fall rather than rise.

On the second argument, that high debt increases the income-sensitivity of consumption, Finansinspektionen (2017a) refers to three studies of the international experiences in Denmark, the UK, and the US for support of its view (Andersen et al., 2016; Bunn and Rostom, 2014; Baker, 2018). Finansinspektionens view is thus that the consumption of highly indebted households is more sensitive to income falls, and this means that high household indebtedness causes a larger consumption fall in recession or crisis. That is, there is a *causal* relation between high indebtedness and a subsequent consumption fall in a recession or crisis.

But the remarkable thing is that these three studies *explicitly contradict* Finansinspektionen’s view. Thus, Andersen et al. (2016, p. 98; italics added) (ADJ) state:

³⁴ Tenant-owner associations normally severely restrict subletting. (Tenant ownership, a kind of cooperative ownership structure, is the main ownership form for apartments in Sweden)

³⁵ It was different in the 1990s crisis and deep recession, when Sweden had a fixed exchange rate and the Riksbank was using very high interest rates to defend the krona against speculative attacks.

[O]ur results *do not support* any interpretation of the data that involves a negative *causal* effect of a high debt level on subsequent consumption growth.

In addition, Bunn and Rostom (2014) (BR14) actually do not claim causality. They carefully note (p. 314):

It is difficult to prove that those more highly indebted households who made large cuts in spending after 2007 did so specifically because of their debts.

In their more extensive working paper (Bunn and Rostom, 2015) (BR15), they more explicitly state (p. 7; italics added):

[We] take care *not to interpret* the observed relationships [between the level of household indebtedness and subsequent spending adjustment] as being proved to be causal.

Finally, Baker (2018, p. 1549; italics added) (Baker) states:

[D]ebt has *little or no independent relationship* with the [income] elasticity of spending when controlling for liquidity and the ability of households to access credit.

Thus, ADJ directly contradict the view that higher household debt *causes* larger consumption falls in a crisis, BR (meaning BR14 and BR15) actually do not claim causality, and Baker directly contradicts the view that household debt causes higher income-sensitivity of consumption. Thus, neither ADJ, BR, nor Baker provide any support for the FI's view.

So what is going on? How can the FI apparently misunderstand these studies? The issue is the elementary distinction between correlation and causality. ADJ, BR, Baker, and several other papers—for example, Mian and Sufi (2010), Mian et al. (2013), and Dynan (2012)—have found a *correlation* between pre-crisis household debt and consumption responses during the financial crisis. But the crucial issue is whether higher household debt *causes* larger consumption responses.

A correlation does not imply causality. High debt and large consumption responses may both be caused by an underlying common factor that has increased both the debt and the consumption response. It follows that just observing high debt is not enough to conclude that the consumption response has increased, because the high debt might have been caused by some other factor that does not simultaneously increase the consumption response. Thus, the underlying factor or factors have to be identified in order to correctly assess whether or not the consumption response has increased and, by extension, whether or not any policy action is warranted.

Put differently, the possible *mechanism* through which the mortgage and housing markets might affect household consumption needs to be identified and confirmed for the correlation between household indebtedness and subsequent consumption responses to be correctly understood and explained.

As discussed in detail in Svensson (2018b), ADJ use microdata to show that highly indebted households before the crisis had much higher consumption relative to their

income than less indebted households. During the crisis they reduced their consumption down to more normal levels relative to income. Less indebted households reduced their consumption much less during the crisis. Furthermore, the highly indebted households financed their overconsumption by increasing their mortgages, that is, through HEW.

There is no evidence of any causal relation between debt-to-income ratios and the fall in consumption. The underlying common factor is instead debt-financed overconsumption, overconsumption financed by HEW. The households that used HEW to finance overconsumption ended up being highly indebted before the crisis. During the crisis, housing prices stopped rising and started to fall, reducing the collateral value of housing. Credit conditions were also tightened. Then the HEW-financed overconsumption could not be maintained, and consumption fell to more normal levels. Thus, debt-financed overconsumption explain both the high indebtedness before the crisis and the consumption fall during the crisis.

For the UK, BR use microdata to find results that are very similar to and—as shown in detail in Svensson (2018b)—fully consistent with those of ADJ. Also for the UK, there is no evidence of any causal relation between pre-crisis indebtedness and the fall in consumption during the crisis. Instead, the correlation between household indebtedness and subsequent consumption falls is explained by the underlying common factor of debt-financed overconsumption.

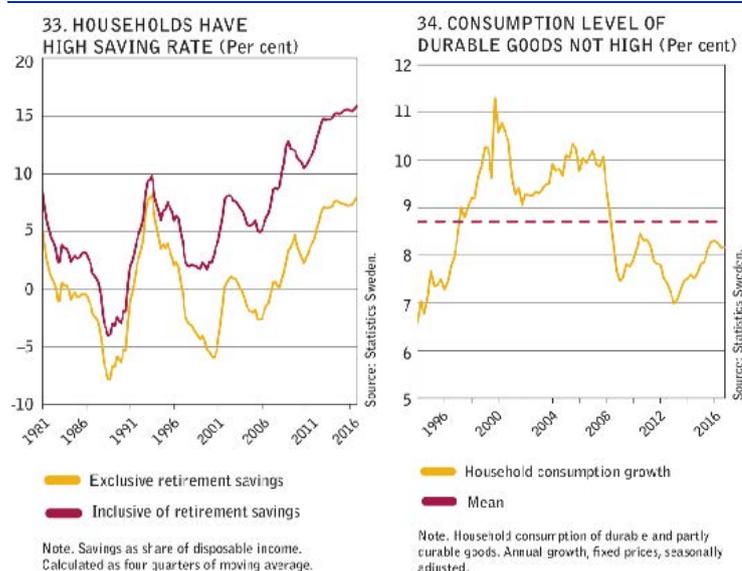
Thus, if HEW are used to finance unsustainable overconsumption, there may be a reason to worry. But, importantly, there is no evidence of any debt-financed overconsumption (and undersaving) by Swedish households. Any such overconsumption and undersaving of macroeconomic relevance would show up in the household saving rate. But the Swedish household saving rate is at a historic high. In contrast, the household saving rate in Denmark, the UK, and the US was very low before the crisis, as in Sweden in the 1980s, before the crisis in the 1990s.³⁶ Indeed, Finansinspektionen says in its financial-stability report that Swedish households are cautious, with high saving and moderate consumption of durables.

Despite optimistic expectations and high margins between income and expenses, households are currently being relatively cautious. The total household saving rate is high and has increased even more over the past few quarters (see Diagram 33). Household consumption of durable goods, which is an indicator of household optimism, is in line with the historical average (see Diagram 34). (Finansinspektionen, 2017b, p. 35):

³⁶ Diagram 33 in figure 3.7 shows that the household saving rate in Sweden was quite low in the late 1980s before the crisis and then jumped a huge 15 percentage points in the crisis in the early 90s, corresponding to a huge drop in consumption. But now household saving is at a historic high, at the same high rate as in the early 1990s without retirement savings, and much higher than in the 1990s including retirement savings.

Figure 3.7

Diagrams 33 and 34 in Finansinspektionen (2017b)



Source: Finansinspektionen, *Stability in the Financial System* May 2017.

For the US, as we have noted, Baker also draws the opposite conclusion from Finansinspektionen. In particular, Baker shows that increases the income-elasticity of consumption is credit and liquidity constraints (p. 28):

[D]ebt has little or no independent relationship with the [income] elasticity of spending when controlling for liquidity and the ability of households to access credit. ... Overall, these results indicate that the primary reasons consumption responses are higher among highly indebted households are credit and liquidity constraints.

Thus, what affects the income elasticity of consumption is not the debt level in itself but liquidity and access to credit. Importantly, because amortization requirements reduce liquidity and access to credit, stricter amortization requirement makes the consumption of these households more sensitive to income, and thus may create the problem it is supposed to solve.

Is really all debt growth above income growth bad and excessive? Thus, Finansinspektionen's argument do not stand up to scrutiny. However, in an op-ed defending the second amortization requirement against substantial public criticism, the director general of Finansinspektionen, Erik Thedéen, used a final argument:

Households' debt is still increasing faster than their income and housing prices are still high. Consequently, the need for action remains. (Thedéen, 2017, my translation from Swedish)

Thus, it seems that, according to the director general, *all* debt growth above income growth is bad and excessive. But this makes little or no sense, as we have seen. Any sustainable fall in the interest rate would normally lead to higher debt-to-income ratios, and higher housing-price-to-income ratios, in order to keep the debt-service-to-income

ratios unchanged. And an increase in housing prices to income due to lower interest rates would lead to higher debt growth for many years, because it takes many years for the whole mortgage stock to be turned over at the higher housing prices. Again, a thorough analysis of what is good and bad debt growth is necessary, that is, whether the debt growth is excessive from a social-welfare point of view.³⁷

As shown in Svensson (2018b), at current housing prices and 10-year mortgage rates, the user cost of housing excluding (real) after-tax capital gains (the sum of operating costs, the real after-tax interest payments and the real cost of housing equity) has fallen substantially relative to disposable income since 2008. Given this, and figures 3.2 and 3.3, housing is hardly overvalued.³⁸ Furthermore, given the high and increasing debt-service capacity and resilience to disturbances of households (Finansinspektionen, 2018b) and figures 3.4 3.6, households are hardly over-leveraged.

Finally, as mentioned, Swedish banks are well capitalized and also very resilient (Finansinspektionen, 2017c). Altogether, there is hardly a case for amortization requirements and any other tightening of lending standards. At least, Finansinspektionen has not provided any convincing case.

3.4.4 Consequences of Finansinspektionen's policy on household debt³⁹

Effects on housing payment, user cost, and involuntary saving. Amortization requirements result in a large difference between the monthly housing payment and the monthly user cost of housing (the implied rent). Many buyers, especially young buyers, who could easily afford the user cost may not have the liquidity or income to make the large housing payment and undertake the large involuntary saving, the excess of the housing payment over the user cost, that is involved. In a life-cycle saving perspective, such a large saving by young individuals is far from optimal.

To be concrete, consider a 25-29-year-old individual who would like to buy an average studio in Stockholm and needs to borrow 85% of its price, which implies a mortgage of SEK 2.38 mn.⁴⁰ Assume that the individual has a monthly gross (earned) income of

³⁷ Finansinspektionen has frequently referred to the December 2013 addition to its objectives mentioned above, "to take measures to counteract financial imbalances with the purpose of stabilizing the credit market," the meaning of which is unclear. With the more explicit objective recommended by (ESRB, 2013, italics added), "to mitigate and prevent *excessive* credit growth and leverage," Finansinspektionen would have had to explain why credit growth or leverage is excessive.

³⁸ If the user cost of housing excluding after-tax capital gains would be quite high relative to disposable income, one might worry that households are speculating in future capital gains and therefore taking on high user costs. It has also been demonstrated that user costs in new owner-occupied housing is lower than rents in new rental housing where rent control is not applied.

³⁹ The consequences of Finansinspektionen's policy, including the effects on household resilience, is examined more thoroughly in Svensson (2018a).

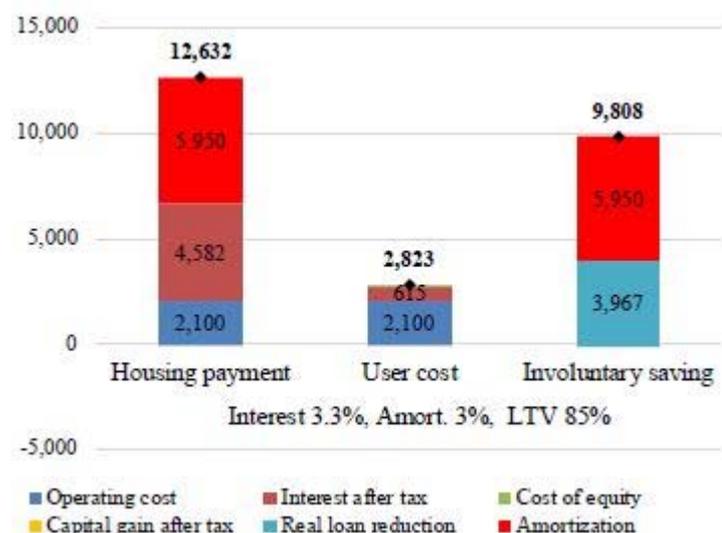
⁴⁰ The average Stockholm studio in a tenant association (the main form of ownership for owner-occupied apartments in Sweden) had a price in 2017 of SEK 2.8 mn, a size of 31 square meters, and a monthly fee to the tenant-owner association of SEK 1,900. The monthly operating cost is set to the monthly fee plus SEK 200 for additional operating costs. Source: Svensk Mäklarstatistik (Swedish Real Estate Agents' Statistics).

SEK 26,000 (EUR 2,600) (implying a monthly net income (income after tax) of about SEK 20,000 (EUR 2,000)).⁴¹

Figure 3.8 shows the monthly housing payment, user cost, and involuntary saving for this individual and this studio. With an LTV ratio of 85% and a debt-to-gross-income ratio of above 4.5, an amortization rate of 3% is imposed. The mortgage rate (and also the cost of equity) is set to 3.3%, approximately the current (May 2018) 10-year mortgage rate and the inflation rate to 2%. The housing payment then equals about SEK 12,600 (EUR 1,260), consisting of the fee to the tenant-owner association plus an additional operating cost, the nominal after-tax interest payment, and the amortization payment. The latter adds about SEK 5,900 (EUR 590) to the housing payment. The user cost, excluding real after-tax capital gains, is only about SEK 2,800 (EUR 280), consisting of the monthly fee, the real after-tax interest payment and the real cost of equity. The difference between the housing payment and the user cost is the involuntary saving, which equals about SEK 9,800 (EUR 980), consisting of the reduction of the real value of the mortgage due to inflation and the amortization payment. As a share of net income, the housing payment, user cost, and involuntary saving are, respectively, 64%, 14%, and 50%. The high payments and involuntary saving relative to the user cost are of course very distortionary for liquidity-constrained buyers.

Figure 3.8

Monthly housing payment, user cost, and involuntary saving in SEK for an average studio in Stockholm



Source: Svensson (2018a).

Notes: The user cost excludes real after-tax capital gains. The interest rate is 3.3% (the current 10-year mortgage rate), the deductible capital-income tax rate is 30%, the amortization rate is 3%, the LTV ratio is 85%, and the inflation rate is 2%. The cost of equity equals the real after-tax interest rate. (The current SEK/EUR exchange rate is about 10.)

Without the amortization, that is, for an interest-only mortgage, the housing payment would only be about SEK 6,700 (EUR 670), the user cost unchanged, and the

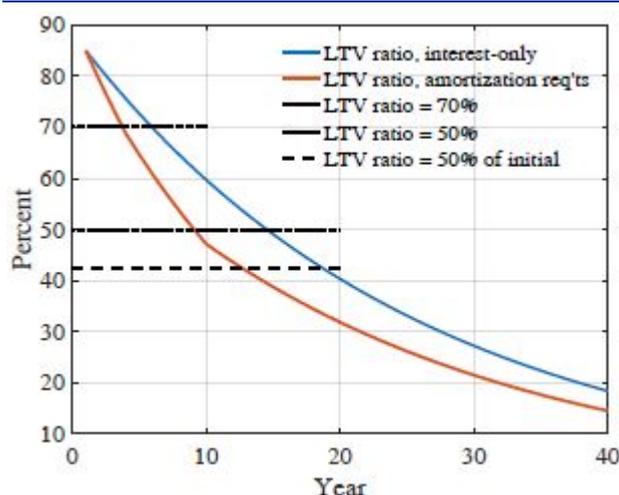
⁴¹ The median monthly gross (earned) income among 25-29-year-old individuals in Stockholm is SEK 24,000 (EUR 2,400). (Earned income excludes capital income.) Source: Statistics Sweden.

involuntary saving about SEK 4,200 (EUR 420). As a share of net income, the housing payment, user cost, and involuntary saving are, respectively, 34%, 14%, and 20%. These are still high but much more manageable.

Effects on the LTV and debt-service-to-income ratios. It is easy to overlook an “automatic” amortization that follows from real growth and inflation. Assume 2% real growth and 2% inflation. Then disposable income and housing prices will normally grow at 4%.⁴² This means that for any given interest-only loan, the LTV and DTI ratios will fall by (approximately) 4% per year and halve in about 18 years, a substantial automatic amortization rate. Is there any reason why an optimal amortization rate would be higher than this?

Figure 3.9 shows LTV ratios over time for this individual and this studio, without and with amortization requirements imposed, when nominal housing-price and income growth is 4%. With amortization requirements, the LTV ratio is halved in 12 years rather than 18 years without.

Figure 3.9
LTV ratios for mortgages without and with amortization requirements



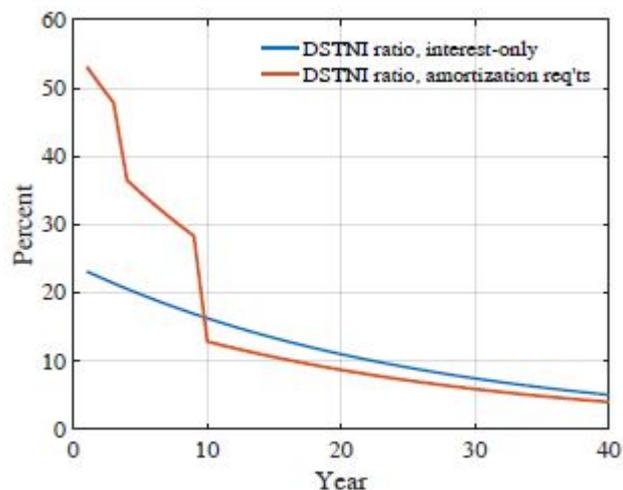
Source: Own calculations.
Notes: Nominal housing prices and nominal incomes are assumed to grow by 4% per year. Loan at origination SEK 2.38 mn (EUR 238,000), initial LTV ratio 85%, initial monthly gross income SEK 26,000 (EUR 2,600), net monthly income about SEK 20,000 (EUR 2,000). Interest rate 3.3%, capital-income tax rate 30%. Amortization rate 2% of loan at origination for LTV ratio above 70%, 1% between 70% and 50%. Additional amortization of 1% of loan at origination for debt-to-gross-income ratio above 4.5.

Figure 3.10 shows the corresponding debt-service-to-net-income (DSTI) ratio. The amortization requirements make the DSTI profile extremely front-loaded. It is difficult to see why such an extremely front-loaded profile would be better than the smooth automatic one for an interest-only loan.

⁴² For young people in the beginning of their professional career, their income may grow considerably faster.

Figure 3.10

Debt-service-to-net-income ratios for mortgages without and with amortization requirements



Source: Own calculations.

Notes: Nominal housing prices and nominal incomes are assumed to grow by 4% per year. Loan at origination SEK 2.38 mn (EUR 238,000), initial LTV ratio 85%, initial monthly gross income SEK 26,000 (EUR 2,600), net monthly income about SEK 20,000 (EUR 2,000). Interest rate 3.3%, capital-income tax rate 30%. Amortization rate 2% of loan at origination for LTV ratio above 70%, 1% between 70% and 50%. Additional amortization of 1% of loan at origination for debt-to-gross-income ratio above 4.5.

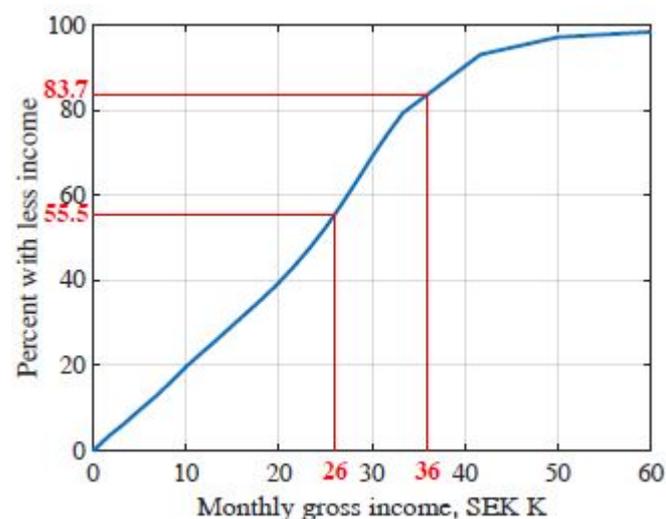
Effects on bank's lending decisions. Consider that before the tightening of lending standards banks used an interest-rate stress test with an interest rate of 6% to assess the affordability of a loan. It is shown in Svensson (2018a) that this individual would just be able to borrow to buy this studio.⁴³ However, with the tighter lending standards with amortization requirements included in the affordability assessment together with a higher interest rate of 7%, or by the banks' applying an internal loan-to-gross-income limit of 5.5, this individual is not allowed to borrow the required amount. The minimum monthly gross income required is instead SEK 36,000 (EUR 3,600) (with a monthly net income of about SEK 27,000 (EUR 2,700)).

Figure 3.11 shows the income distribution of individuals of age 25-29 years in Stockholm. We see that 56% of the 25-29-year-olds in Stockholm have a monthly gross income below SEK 26,000, so only the top 44% of the income distribution qualified for the loan. Furthermore, we see that 84% of the 25-29-year-olds in Stockholm have a monthly gross income below SEK 36,000, so only 16% qualify for a loan after the tightening of lending standards. Thus, the tightening of the lending standards have excluded an additional 28% of the age group from this market for owner-occupied studios. This can be seen as a credit contraction of $(44 - 16)/44 = 64\%$ for this age group, a very large contraction.

⁴³ In their affordability assessments, the banks use an interest-rate stress test to calculate the minimum income that covers interest payments, taxes, fees to the tenant-owner association and possibly additional operating costs, amortization payments, and benchmark living expenses.

Figure 3.11

Cumulative income distribution 2016 for individuals of age 25-29 years in Stockholm Municipality



Source: Statistics Sweden.

Notes: The vertical axis shows the percentage of individuals that have less gross income than the gross income on the horizontal axes. Individuals with zero gross income are excluded. The sample refers to individuals who lived in Sweden the whole year of 2016. The mean and median monthly gross income for those with positive income are, respectively, SEK 23,560 (EUR 2,356) and SEK 23,350 (EUR 2,335).

Due to rent control, there is no working rental market in Stockholm, only a very expensive subletting market. According to Qasa (2018), market rents for studios in the subletting market are about SEK 10,000 (EUR 1,000) per month (50% of the net income of the above individual with gross income SEK 26,000 (EUR 2,600)). And the market rent is both housing payment and user cost, with no involuntary saving, see figure 3.12. Furthermore, the leases are normally short-term, requiring tenants to move frequently, sometimes several times a year.

Figure 3.12

Monthly housing payment, user cost, and involuntary saving in SEK for an average studio rental in the Stockholm subletting market



Source: Qasa (2018).

Notes: For a rental, the housing payment and the user cost simply equal the rent. The involuntary saving is zero. (The current SEK/EUR exchange rate is about 10.)

For those with income equal to this minimum income of SEK 36,000, so they are barely allowed to borrow, the user cost is only about 10% of their net income. But due to amortization requirements, the actual housing payment (monthly fee, additional operating cost, interest payment after tax, and amortization) are 45% of their net income, so their involuntary saving rate is 35% of net income. That young people should have to save so much makes no sense from a life-cycle perspective. The distortions and welfare losses caused by this are obvious.

Furthermore, above we noted that the objective of Finansinspektionen includes “to ensure that the financial system ... has smoothly functioning markets that meet the needs of households ... for financial services, and provides comprehensive protection for consumers.” It seems to me that a policy that excludes 84% of 25-29-year-old individuals from borrowing to buy an average studio that they could easily afford (in the sense that the user cost is a reasonable share of their net income) is hardly a policy that “meets the need of households for financial services,” nor does it “provide comprehensive protection for consumers” to direct these individuals to the Stockholm second-hand rental market.

Effects on households’ resilience. Finansinspektionen has argued that the amortization requirements will increase households’ resilience. But that is difficult to see. Amortization requirements increase the share of fixed payments in the households’ payments and thereby make them less resilient to disturbances in the form of interest-rate increases and income losses due to unemployment. Indeed, Finansinspektionen’s own stress tests trivially show that amortization requirements, by reducing households’ discretionary income, reduce their resilience (Finansinspektionen, 2018b, Diagram 31). Furthermore, the example in figure 3.10 shows that that the debt-service-to-income ratio can be substantially higher for many years with amortization requirements.

In particular, amortization is saving in the form of more equity in housing, which is an illiquid asset. The saving in terms of reduced debt is not later available at the households' discretion. Without amortization, the households can instead save in financial assets and create a more efficient assets-and-liabilities portfolio, including a liquidity buffer. This way the households can better overcome temporary difficult times and better maintain their consumption and standard of living. Clearly less liquidity constraints and more diverse assets will increase resilience.⁴⁴

Furthermore, consider the 84% 25-29-year-olds that are excluded from borrowing to buy an average Stockholm studio. It is difficult to see that they would be more resilient if they have to turn to the subletting market and pay very high rents. Not only are the rents and thereby the user cost very high and hardly allow any saving. Also, rents do not fall and the tenants' cash-flows do not improve when interest rates fall in bad times.

3.5 Conclusions on macroprudential policy

As mentioned, macroprudential policy is a quite new policy. There are only a few years of experience yet. It is desirable that macroprudential policy can become as established a policy as monetary policy, with clear objectives, a set of sufficient instruments, and clear accountability for policymakers.

Macroprudential and monetary policies are, at a closer look, very different policies, with different objectives, different suitable instruments, and normally relatively limited interaction. There is a strong case for them being conducted separately, preferably with separate decision bodies, as in the UK with two committees within the central bank, or as in Sweden with central bank in charge of monetary policy and Finansinspektionen in charge of macroprudential policy.

Furthermore, macroprudential policy is much more complicated than monetary policy. Monetary policy is arguably the simplest of economic policies, with a simple objective, a few well-used and well-understood instruments, a relatively simple and well-understood transmission mechanism, well-established systems of governance, and established mechanisms to hold policymakers accountable.

In macroprudential policy, the objective, financial stability, is much more complicated. Systemic risk and resilience of the financial system are difficult to assess and measure. There are more instruments, their effects are less known, and the transmission mechanism from instruments to objective is more complicated and less well understood. Nevertheless, there are several lessons from monetary policy that apply to macroprudential policy, for example, regarding governance and accountability. Like monetary policy, macroprudential policy is likely to be best conducted not by a single decision maker but by a committee, like the FPC of Bank of England, also when it is conducted by an authority separate from the central bank, as

⁴⁴ The results of Baker (2018) imply that less binding liquidity constraints reduce the consumption elasticity of income regardless of the level of debt.

in Sweden. A committee for macroprudential policy may include experts on macroprudential policy, finance, regulation, housing, household finance, and so on, given that macroprudential policy is a quite complicated policy that requires deep understanding of the working of the relevant parts of the economy and the effects of different policy actions.

Even though macroprudential policy is more difficult to evaluate, it should be possible to introduce mechanisms similar to those in monetary policy to evaluate macroprudential policies and to hold policymakers accountable.

There are several lessons from the Swedish example of macroprudential policy. They may apply to other economies where authorities worry about the growth of housing prices and household debt. The main problem, it seems, is to distinguish between good and bad credit growth. Preventing good credit growth may have high economic and social costs. Not preventing bad credit growth may also have high economic and social costs.

Assessing whether household debt growth and leverage are excessive requires a deep understanding of the determinants and dynamics of housing prices and household debt. Macroprudential authorities need to have a deep understanding of housing economics, the housing market, and household finance. A committee with some members being experts in relevant areas may reduce the risk of policy mistakes compared to a single decision maker. The situation is made more complicated by the housing and mortgage markets being very different in different economies. There is a tendency to draw conclusions in a quite superficial way from experiences in other countries without a thorough examination of the nature and causes of those experiences and whether these apply to the macroprudential authority's own economy. Instead of generalizing, one has to look at each economy separately and understand how the housing and mortgage markets work there.

In order to distinguish bad, excessive household debt growth from good credit growth, one has to identify the factors causing the growth. One has to determine whether these factors are due to some market failure that increases systemic risk above what is acceptable and reduces the broad financial system's resilience below what is acceptable. If so, one has to consider what policy actions may be justified, consider what their costs and benefits are, and provide a convincing favourable cost-benefit analysis for the proposed action. Just observing high credit growth is not enough.

In the particular Swedish case of high household indebtedness and a possible associated macroeconomic risk of a future consumption fall, it is important to realize that the international experience from several countries of a *correlation* between pre-crisis household indebtedness and consumption falls during the crisis does not imply *causality*. Instead, the evidence is that the pre-crisis high household indebtedness and the large consumption fall during the crisis was caused by the common factor of debt-financed overconsumption before the crisis, an overconsumption that could or would not be maintained when the crisis arrived. From that perspective, debt used to finance overconsumption is bad debt. But because there is no evidence of such debt-financed overconsumption in Sweden, there is no evidence that high household indebtedness implies a macroeconomic risk of this kind

in Sweden. There is indeed no evidence that Swedish household debt is bad debt. Furthermore, the strong household cash-flow channel for monetary policy — because of high debt and variable mortgage rates — may even reduce the risk of future recessions.

It is obviously important to determine what the actual problem is. In this Swedish example, the problem is arguably a fundamentally structural one, namely increasing demand for housing and insufficient supply, which contributes to rising housing prices and household debt, without necessarily increasing the systemic risk or reducing the resilience of the financial system or the economy. In this situation, Finansinspektionen is tightening lending standards. This reduces credit supply, which hurts households and individuals with little wealth that need to borrow to buy a home, a category that includes many young households and individuals. Such a policy has obvious and large welfare costs, especially in the absence of a functioning rental market. Macroprudential policy to tighten lending standards is hardly the best policy to deal with this structural housing problem. Indeed, to the extent that it causes less construction of new housing, it makes the structural problem worse. What is needed above all is a better housing policy that brings supply in line with demand, including deregulation that results in a working rental market.

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Discussion on “The future of monetary policy and macroprudential policy” by Lars Svensson

By Dirk Schoenmaker¹

1 Introduction

The interesting and broad paper by Lars Svensson (2018) is fitting Vítor Constâncio’s broad interest. Vítor has always promoted a broad mandate for the central bank and has been pro-active in both monetary and macroprudential policy. This approach fits in the tradition of many continental central banks as well as the Bank of England that monetary stability and financial stability are two sides of the same coin. By contrast, the Bundesbank approach used to focus on monetary stability, which should not be distracted by financial concerns. Interestingly, this approach may suit the German economy, where home ownership is low. The German economy has thus less need for a central bank stabilising the housing cycle.

During the great financial crisis with banking problems across the euro area and bursting housing bubbles in Ireland and Spain, the ECB switched from the narrow central bank to the broad central bank model (Hartmann, Huang and Schoenmaker, 2018). Vítor Constâncio has contributed to this switch and has continuously stressed the need for macroprudential policy to address resilience and financial imbalances (e.g. Constâncio, 2016, 2017; 2018). Moreover, the ECB assumed also a microprudential mandate in 2014.

The paper by Las Svensson (2018) very aptly covers the areas of monetary policy and macroprudential policy as well as the interaction between the two areas, which has been problematic in his home country, Sweden. Following the structure of the paper, I discuss the paper in two parts, with a focus on the second part.

2 Monetary policy

Svensson (2018) provides an authoritative overview of current and future monetary policy. The monetary policy strategy is a form of flexible inflation targeting with a focus on price stability and full employment. There are some squabbles whether price stability should come first or both objectives should get equal weight. The ECB is still leaning towards the former and Svensson towards the latter view. But these are shades of grey and not issues of principle. I note that the current monetary policy

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strategy is far removed from the original two pillar strategy at the start of the ECB, with a monetary pillar and economic analysis pillar. But money has disappeared from the strategy and even from Svensson's analysis.

Svensson (2018) promotes forecast targeting. Information on the economy, economic activity and prices are needed as well as information on the transmission mechanism to assess the impact on the forecasts of inflation and employment. In this setting, financial stability should not be a goal of monetary policy, with which I concur.

However, I do not agree with the one-sided focus on economic analysis. The banking, and wider financial, system matters for the transmission of monetary policy. A hampering financial system reduces the effectiveness of monetary policy. Shin (2018) mentions, for example, the role of bank capital in monetary transmission. Undercapitalised banks will not expand credit when interest rates are lowered, but will first restore capital. So central banks should also pay attention to the financial system in their monetary analysis.

3 Interaction monetary and macroprudential policy

Svensson (1952) argues that macroprudential policy is different and separate from monetary policy. This follows from the Tinbergen rule (Tinbergen, 1952), that each policy should have its own instrument. I also agree that it follows that there should be separate decision-making bodies. But how to organise? The choice of objective for macroprudential policy is very important for allocating macroprudential powers. Svensson (2018) argues that macroprudential policy should be aimed at the resilience of the financial system. I would argue that both resilience and financial imbalances should be addressed. I thus side with Constâncio (2016, 2017 and 2018), who has consistently argued to include financial imbalances as well.

Resilience is about the structural side of the financial system. Is the system 'resilient' enough to withstand shocks. Any financial authority could check that; hence Lars Svensson's slight preference for the financial supervisory authority.

In a paper at the Advisory Scientific Committee of the European Systemic Risk Board, we argued that the structural and cyclical dimension of the financial system should be covered. The cyclical component gives rise to time inconsistency, just as in monetary policy. Independence of the political cycle is therefore important in macroprudential policy.

From this analysis, it follows that the central bank has a comparative advantage in macroprudential policy. It has the necessary independence from government and the necessary macro-economic (and financial) expertise. More than 15 years back, we argued that micro supervisors have a more legal and institution specific focus, while central banks have a more macro approach. The dominant expertise and resulting culture in financial supervisors are more legal and accountancy based, while the expertise and culture in central banks are more macro-economic focused.

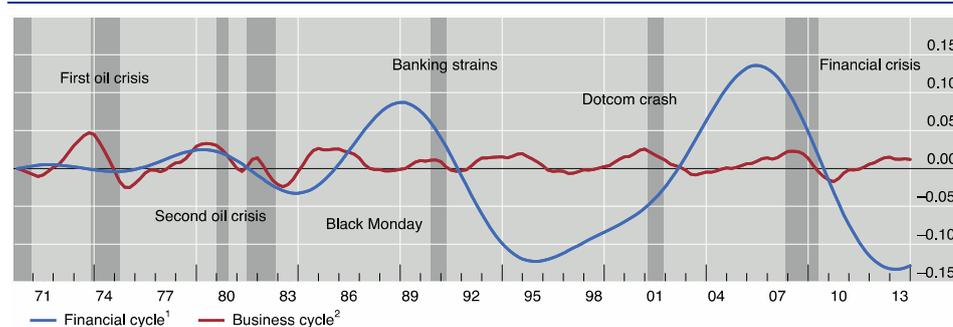
My favourite set-up is the Bank of England approach, with two separate committees for monetary policy and financial policy (covering macroprudential policy). The Bank of England Governor is heading both committees, which include Bank of England directors and outsiders as members and a representative of HM Treasury as observer. This set-up is conducive to a macro-approach in both areas, while allowing for separate decision-making.

4 Macroprudential policy

As argued earlier, Svensson (2018) regards resilience as the primary goal of macroprudential policy. This is part of a broader tendency of looking at the structural side. Svensson (2018) argues that the lack of housing supply explains house price growth. In a similar vein, Greenspan argued that the new economy could explain economic expansion at the turn of the century, till the economic bubble burst and the business cycle was rediscovered.

In their epic work ‘This Time is Different’, Reinhart and Rogoff (2009) document the tendency to attribute change to structural factors (the ‘this time is different’ fallacy), ignoring cyclical pressures building up. The financial system has even become more pro-cyclical than the economy (Borio, 2014). Figure 1 illustrates the business cycle and financial cycle (defined as credit growth and house price growth). They do not move in tandem. Moreover, the amplification of the financial cycle is higher than that of the business cycle.

Figure 1
Business and financial cycle



Source: Borio (2014).
Note: The red line denotes the business cycle and the blue line the financial cycle in the US.

There is thus a need to dampen the financial cycle for financial stability purposes. Moreover, Mian, Rao and Sufi (2013) show that there is a strong feedback effect to consumption. When house prices rise, home owners feel richer and consume more. The reverse happens when house prices fall. This consumption channel forms a strong interconnection between the financial system and the economy.

Recognising the need to curb excessive credit growth, Svensson (2018) tries to make a distinction between good and bad credit growth. But can we really distinguish? I believe that the proposed indicator ‘interest expenditure to income’ is not appropriate

and falls foul of the Minsky instability hypothesis: stability breeds instability. In good times, risks are underestimated. Moreover, the current quantitative easing practised in Sweden and the euro area keeps interest rates low. So, on an interest expenditure to income ratio, the current housing bubble in Sweden looks sustainable (a flat line in Graph X in Svensson, 2018). Rising house prices are matched by declining interest rates and thus look fine.

But what if interest rates start to rise? Current levels of house prices will become unsustainable causing a drop in house prices, which may set in motion a housing bust following the current boom. In defence, Svensson (2018) argues that interest rates are low or may decline in a recession, but Figure 1 shows clearly that the business and financial cycle are not synchronised (Borio, 2014).

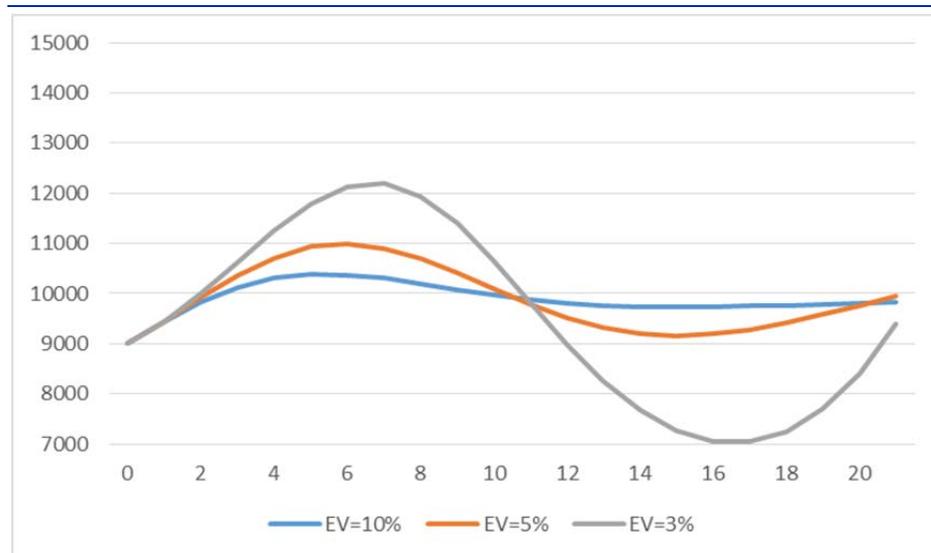
That is why conduct of business supervisors, which aim to prevent unsustainable household debt, test for a fixed interest rate scenario (for example, 5 or 7 percent). Can households still afford the mortgage interest and principal payments, assuming a 5 percent interest rate? If not, then the mortgage debt is too high for the household and should not be provided by the financial institution. It is dangerous to look at mortgage affordability at current interest rates, as we know that interest rates can and do fluctuate. So the interest expenditure to income ratio in Sweden gives a false sense of comfort.

Svensson (2018) argues correctly that it is strange to use the price to income ratio, because the first is a stock variable and the second a flow variable. That can be solved by taking a fixed interest rate of 5 percent (or any other number), effectively translating the debt to a flow variable through the annual interest payments. We are then back to a debt (or price) to income ratio.

There is a trade-off between structural and cyclical measures. Simulating a mortgage credit cycle, we find that a lower level of equity in banks leads to a stronger cycle (Schoenmaker and Wierdsma, 2017). Higher leverage provides a stronger incentive to a profit-maximising bank to grow (mortgage) credit, as illustrated in Figure 2. By contrast, higher levels of equity in banks (that is lower leverage) lead thus to smaller amplifications in (mortgage) credit growth.

Figure 2

The mortgage credit cycle with varying bank equity



Source: Schoenmaker and Wierds (2017).

Note: The simulation of mortgage credit (y-axis) is run with 3, 5 and 10 percent of bank equity to total bank assets (a simplified leverage ratio).

5 Housing and consumption

Housing is connecting monetary and macroprudential policy. While housing boom-bust cycles are usually identified as a major source of financial instability, Mian and Sufi (2014) show convincingly that the bursting housing cycle in the United States had an equal (if not bigger) impact on the economy through the consumption channel. This is generally ignored.

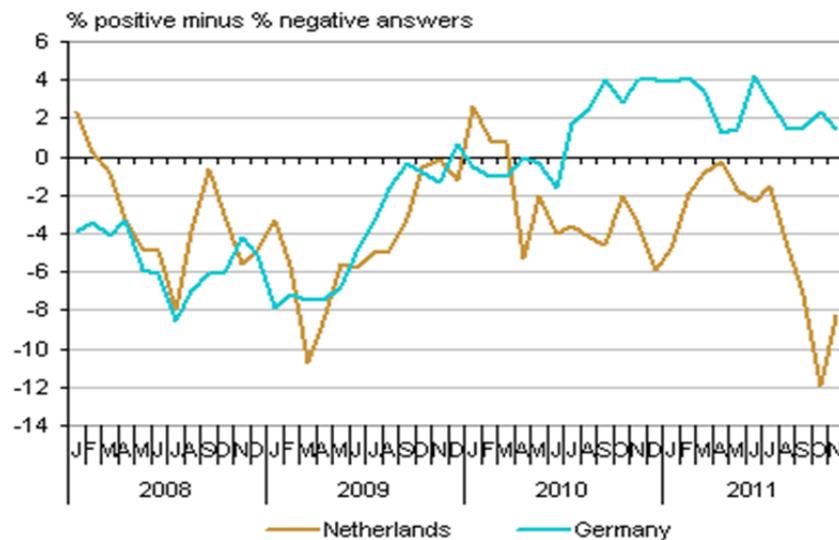
Differences in the housing cycle can, for example, explain part of the economic divergence between Germany and the Netherlands. Back in 2011/2012, economic growth remained subdued in the Netherlands due to low private consumption. While some Keynesian economists blamed cuts in government spending, Figure 3 and 4 show that declining house prices form an important part of the explanation. Figure 3 shows the housing bust from 2009/10 to 2014, which ended up with one out of six households in the Netherlands having negative equity (that is the value of the house is lower than the mortgage). Figure 4 illustrates the divergence in consumer expectations back in 2011 between Germany and the Netherlands.

Figure 3
Relationship house prices and consumption



Source: DNB (2018).

Figure 4
Consumer expectations (2011)

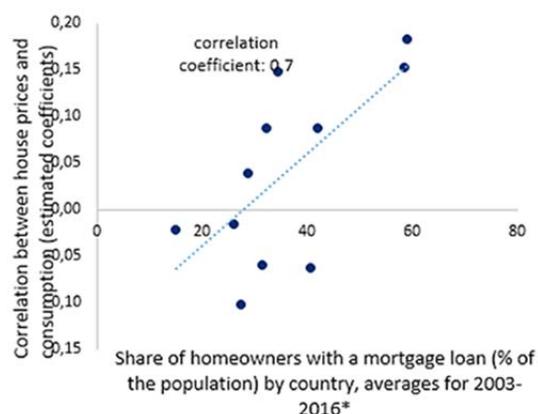


Source: CBS and European Commission.

The final question is why is German consumption less impacted? DNB (2018) finds a correlation of 0.7 between homeownership on the one hand and correlation between house prices and consumption on the other hand (Figure 5). While the share of homeowners with a mortgage is very high in countries like the Netherlands, Sweden, Denmark and the United Kingdom, homeownership is very low in Germany. So, Germany was (and still is) less exposed to a housing boom-bust cycle. The current rise of house prices in the Netherlands can partly explain the stronger performance of the Dutch economy than the German economy.

Figure 5

Homeowners and correlation house prices and consumption



Source: DNB (2018).

6 Concluding remarks

Svensson (2018) provides a very interesting overview. He rightly argues that monetary and macroprudential policy are separate policy domains, which warrant separate instruments and decision-making. But he underestimates the cyclical component of financial (in)stability and the feedback loops from the financial system to the economy through asset prices (notable house prices). I argue therefore that macroprudential policy should address resilience as well as financial imbalances. Vítor Constâncio has always been a proponent of anti-cyclical macroprudential policy.

Another outstanding issue, which is beyond the scope of Svensson's paper and my discussion, is whether such policies should be done from the centre at the ECB or from the capital cities in the respective member countries (Sapir, 2014; Schoenmaker, 2014).

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The euro and the theory (and practice) of Monetary Union

By Barry Eichengreen¹

1 Introduction

This chapter reproduces the presentation slides of the speaker.

“From all appearances the process of European monetary unification continues to gather momentum. Nearly four years have passed since the last significant realignment of exchange rates of members within the European monetary system (EMS). All significant controls on capital movements among member countries have been removed. Discussions of the establishment of a European central bank and a single currency are proceeding apace. If the current timetable is observed the transition will have been completed by the end of the decade.

At the same time there remain serious questions about the advisability of a European Monetary Union (EMU) voiced, in the most recent round of discussions, by the governments of the United Kingdom and Spain. By definition, EMU involves a sacrifice of monetary autonomy. In response to country-specific shocks, governments will no longer have the option of adopting a monetary policy which differs from that of the union as a whole. Insofar as monetary policy is useful for facilitating adjustment to disturbances, adjustment problems may grow more persistent and difficult to resolve.

These concerns are reinforced to the extent that it is believed that completion of the internal market will place new limits on the use of fiscal policy. Not only will individual governments have lost autonomy over the use of seigniorage to finance budget deficits but, insofar as the 1992 process renders factors of production increasingly mobile, constraints will be placed on their ability to impose tax rates significantly different from those of their neighbours. Limits on their ability to tax in the future will limit their ability to run budget deficits in the present; hence all important fiscal instruments may be constrained. The sacrifice of monetary autonomy is potentially all the more serious.”²

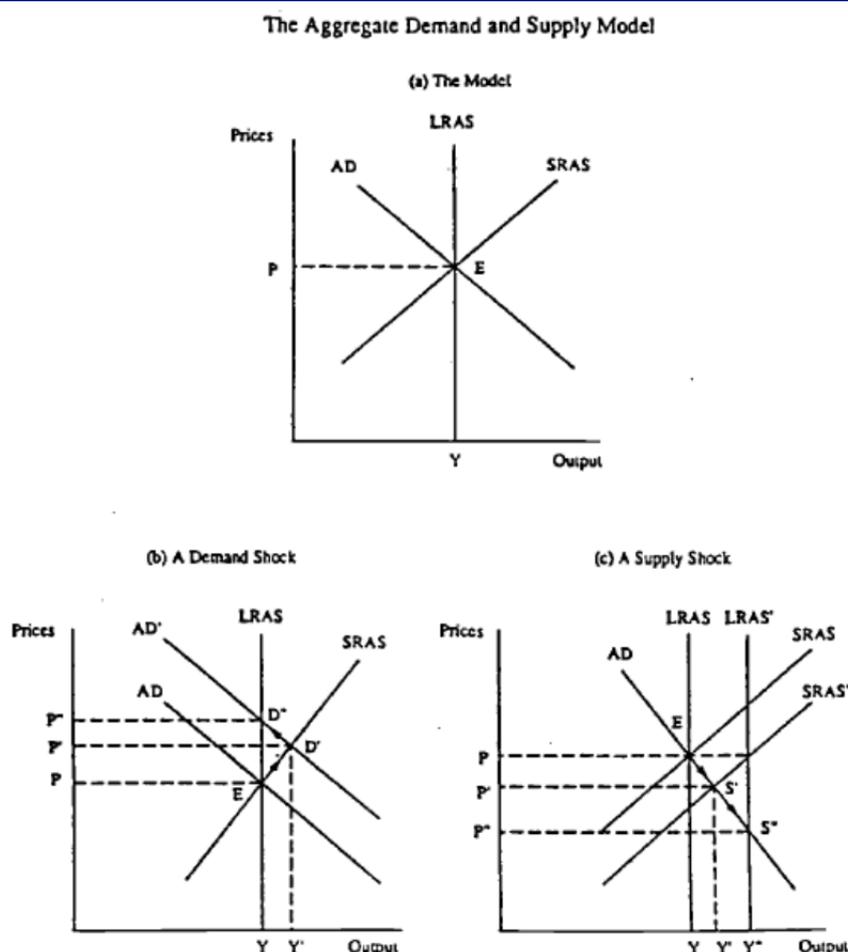
¹ University of California, Berkeley.

² Bayoumi, T. and B. Eichengreen (1993), “Shocking Aspects of European Monetary Unification,” in F. Torres and F. Giavazzi eds, *Adjustment and Growth in the European Monetary Union*, Cambridge: Cambridge University Press, pp. 193-229.

- Closing in on 2,000 citations last time I looked.
- In which we argued that proceeding with a large monetary union, including not just the Northern European core but also the “Club Med” countries, was a mistake.
- We built on the theory of optimum currency areas – as in Mundell 1961.
- This being the framework traditionally used to study the suitability of different economies for forming a monetary union.
- Emphasizing symmetry or asymmetry of macroeconomic “shocks” and speed of adjustment.

2 Our basic framework was the textbook Aggregate Supply/Aggregate Demand model

Figure 1
The Aggregate Demand and Supply Model



Source: Bayoumi, T. and B. Eichengreen, (1993), “Shocking Aspects of European Monetary Unification”.

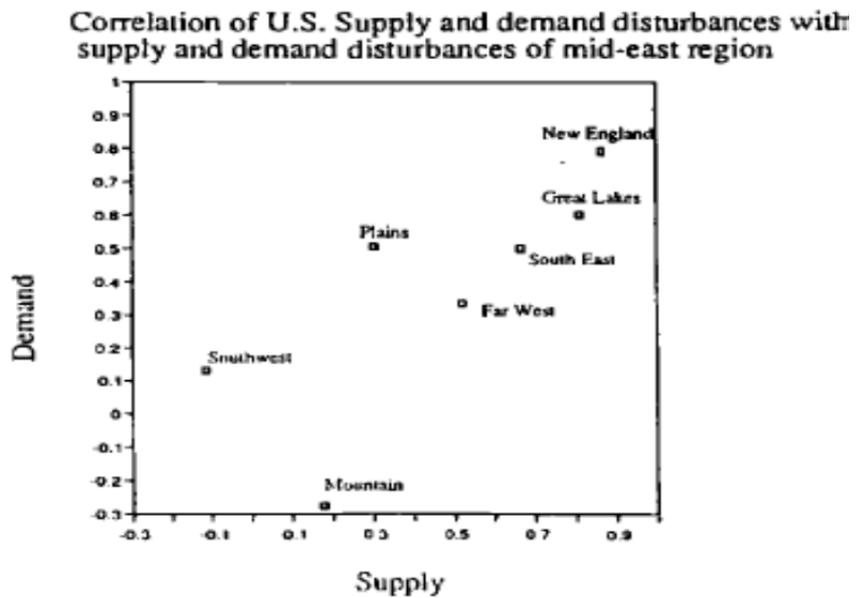
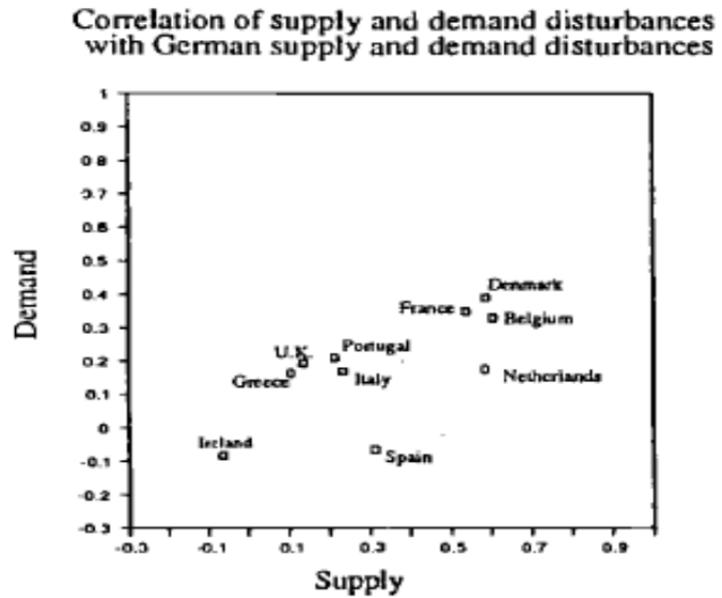
- In this model (see Figure 1), aggregate demand shocks raise output temporarily but prices permanently – as at lower left.
- Aggregate supply shocks, in contrast, both raise output permanent and reduce prices permanently – as at lower right.
- We then estimated these two relationships using time series on both prices and output, country by country – more precisely, their first differences.
- We distinguished two shocks, one that was constrained to affect output only temporarily but prices permanently (“temporary” or “aggregate demand” shocks) and a second that was allowed to affect both output and prices permanently (“permanent” or “aggregate supply” shocks).
- Specifically, we estimated a bivariate vector autoregression in prices and output (more precisely, in their log differences) with 2 lags and structural restrictions imposed.
- We looked at how correlated (“symmetric” or “asymmetric”) estimated shocks were across countries.
- Throughout, the standard of comparison was the United States, which appears to satisfy the preconditions for a workable monetary union.

For the period 1963-1988

- Correlation of shocks with those in the anchor region (Germany and the Mid-Atlantic states respectively) was lower in Europe than the US (see Figure 2).
- Moreover, there was a distinction: members of European “core” resembled the US, while “Club Med” countries did not.
- Notice who the problem countries were: Portugal, Ireland, Italy, Greece and Spain, together with the UK.

Figure 2

Correlation of demand supply shocks with anchor areas



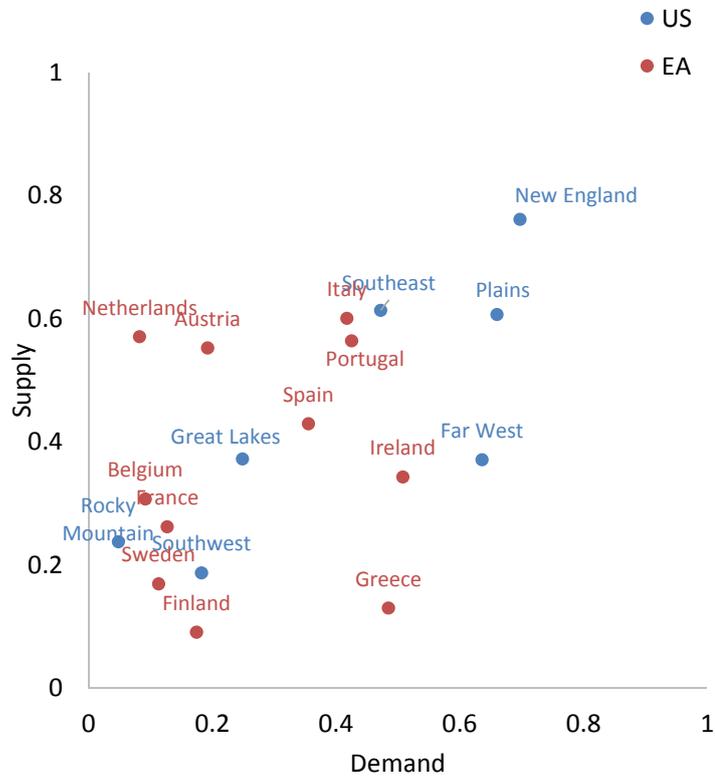
Source: Bayoumi, T. and B. Eichengreen, (1993), "Shocking Aspects of European Monetary Unification".

Here's the update (1994-2014)

- Europe still looks like less of an optimum currency area than the United States, judged by the symmetry of shocks (see Figure 3).
- To be a smoothly-functioning monetary union, you want to be toward the upper right.

- But red dots for Europe tend to be lower and more to the left.

Figure 3
Euro Area vs United States (1994-2014)



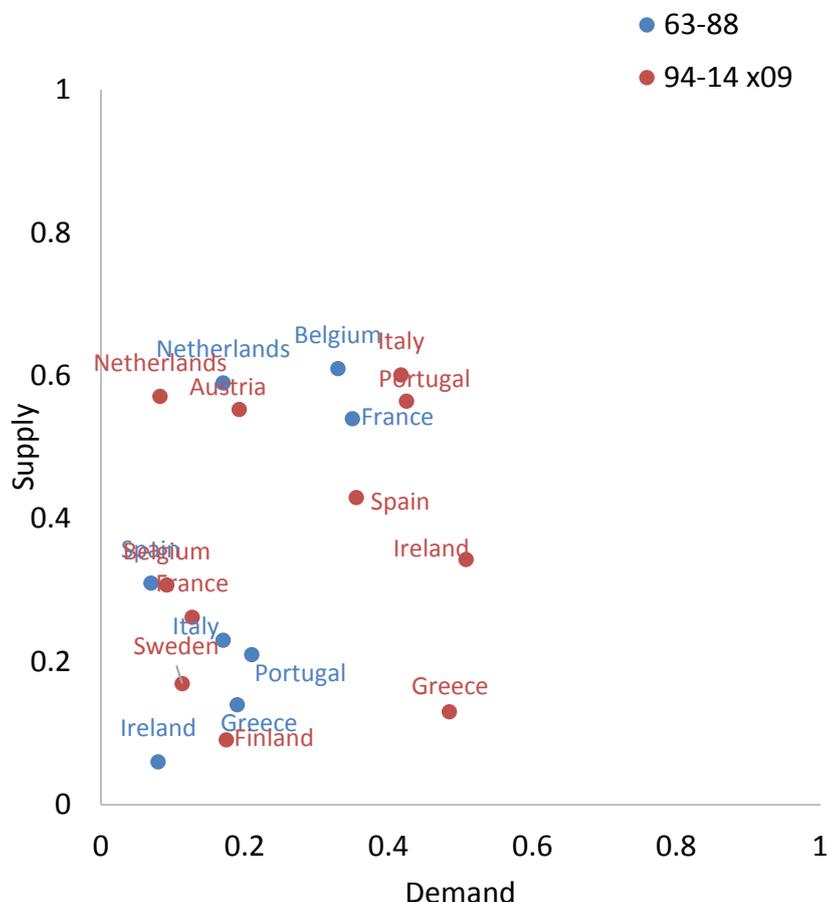
Source: Bayoumi, T. and B. Eichengreen (2017) "Aftershocks of Monetary Unification: Hysteresis with a Financial Twist" IMF Working Paper 17/55.

- The US data points still look very similar to before
- The main change is that the Great Lakes have moved down and to the left – Perhaps reflecting the ongoing decline of manufacturing there.

Europe looks a bit more like an optimum currency area today than in 1963-88

- While the symmetry of aggregate supply shocks remains the same as in the earlier period (see Figure 4), demand shocks have grown more symmetric:
 - Red dots are further to the right than blue dots.
- This is not unexpected – monetary policy shocks are now more symmetric.

Figure 4
Euro Area (1994-2014 vs 1963-1988)



Source: Bayoumi, T. and B. Eichengreen (2017) "Aftershocks of Monetary Unification: Hysteresis with a Financial Twist" IMF Working Paper 17/55.

But there is also an unexpected change

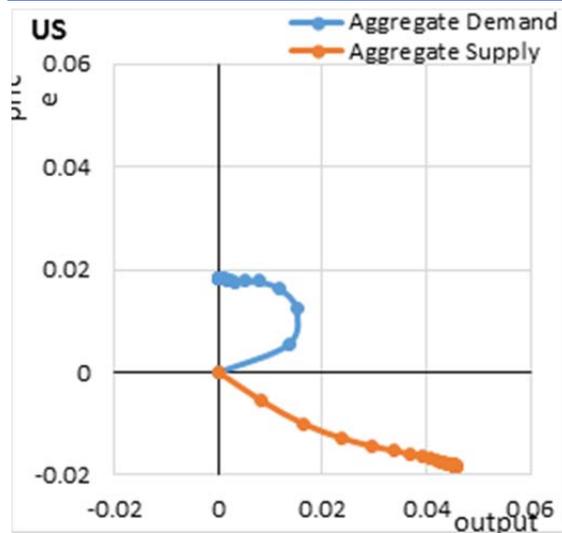
- Shocks (demand shocks especially, but supply shocks as well) have grown more symmetric with those in Germany not in Northern Europe but in the crisis countries.
- This is the big surprise from our update.
- We argue that it reflects capital flows between Northern and Southern Europe on a scale that did not exist before the euro.
- Large capital flows from Germany to the South led these economies to boom together between 2001 and 2008 in particular.
- The fact that these correlations turn out to be much lower when we control in the VARs for a variety of financial variables is consistent with this interpretation.

- And there is a further twist...

The impulse-responses for the US conform to the textbook model

Figure 5

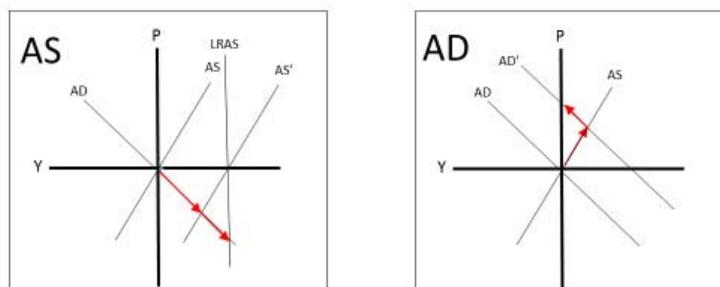
US impulse responses



Source: Bayoumi, T. and B. Eichengreen (2017) "Aftershocks of Monetary Unification: Hysteresis with a Financial Twist" IMF Working Paper 17/55.

- When we update from 1972-88 to 1994-2014 (see Figure 5), the U.S. impulse-responses are "well behaved" – they look the same as before.
- Demand shocks (in blue) raise output temporarily, prices permanently.
- Supply shocks (in red) raise output while reducing prices.
- They look like this, in other words (see Figure 6).

Figure 6
US Adjustment: AD/AS



Source: Bayoumi, T. and B. Eichengreen (2017) "Aftershocks of Monetary Unification: Hysteresis with a Financial Twist" IMF Working Paper 17/55.

In Europe, however, the impulse responses now look peculiar

- They were "well behaved" before the euro (again, as at right, Figure 5).

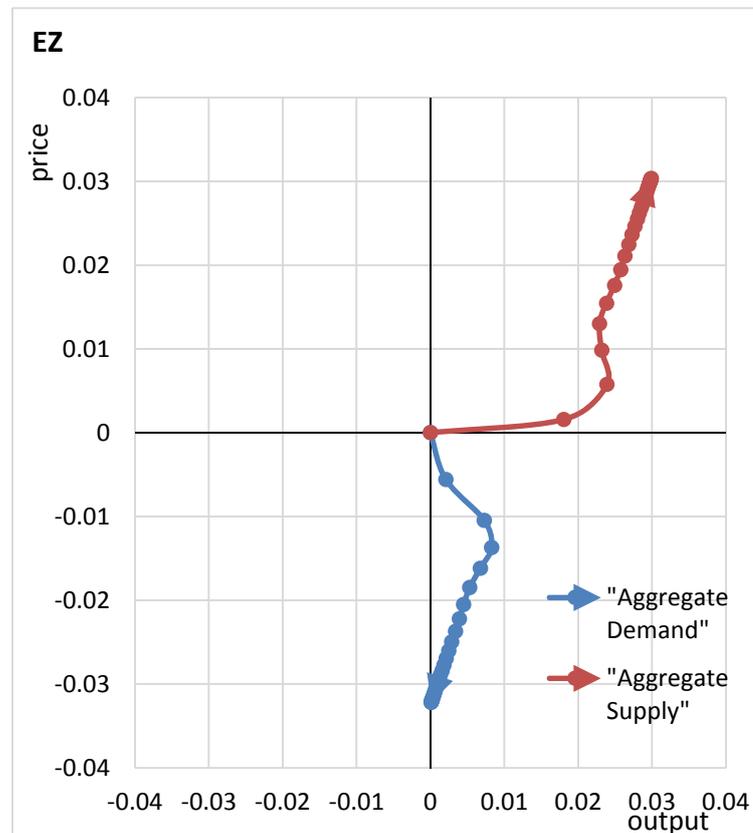
But now:

- Positive supply shocks raise output but also raise prices – where the textbook says prices should go down.
- Positive demand shocks appear to reduce prices – where textbook economics say they should raise them.

Euro area impulse responses look like this

Figure 7

Euro area impulse responses



Source: Bayoumi, T. and B. Eichengreen (2017) "Aftershocks of Monetary Unification: Hysteresis with a Financial Twist" IMF Working Paper 17/55.

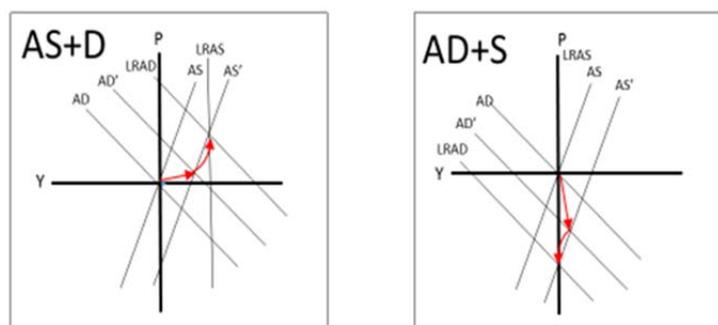
- They were "well behaved" before the euro (as at right).
- But now:
 - Positive supply shocks raise output but also raise prices – where the textbook says prices should go down.
 - Positive demand shocks appear to reduce prices – where textbook economics say they should raise them.
- So how might we understand this?

How might we understand this?

- Our hypothesis is that the positive AS shock sets off a positive AD shock (see Figure 8).
- And the positive (negative) AD shock sets off a negative (positive) short-run AS shock.

Figure 8

Euro Area Adjustment: Financial Hysteresis



Source: Bayoumi, T. and B. Eichengreen (2017) "Aftershocks of Monetary Unification: Hysteresis with a Financial Twist" IMF Working Paper 17/55.

Our hypothesis: hysteresis and the financial cycle

- The financial cycle means that positive supply shocks set off a financial response also affecting demand.
- And that positive demand shock is permanent, absent another shock (hence the hysteresis).
- Where hysteresis of course is "the dependence of the state of a system on its history."

Hysteresis and the financial cycle

Consider the left-hand panel of Figure 8:

- A positive supply shock first raises output.
- Because (plausibly) a more stable policy environment due to the euro increases supply.
- This boosts productivity and profitability.
- This in turn raises asset prices and sets off a lending boom.
- The lending boom increases aggregate demand (in the case depicted, even more than supply).
- And the higher prices result.

- This is the “pre-2008 case”, when the peripheral countries experienced a positive supply shock, a lending boom, and higher output together with higher prices (a loss of competitiveness).
- Now run the experiment in reverse (“post 2008”).
- Think of a negative supply shock due to impairment of the financial system.
- Lower prices also mean an asset-price slump and therefore less lending.
- Demand falls along with supply (demand curve shifts to the left).
- The result is recession and deflation. Hysteresis implies that there is a permanent decline in output.

For completeness, consider the right-hand panel of Figure 8:

- Negative demand shock reduces output, but also induces an increase in aggregate supply.
- Intuitively, prices fall with the negative demand shock, which makes producers more competitive on international markets (higher export margins), inducing them to increase supply.
- While output remains roughly unchanged, prices fall.
- So again, the result of post-2008 events is temporary stabilization of output (2008-9) but deflation.

Conclusion

- It is no surprise that the euro area continues to experience difficulties.
- It remains further than the benchmark represented by the United States from satisfying the preconditions for an Optimum Currency Area.
 - Shocks are still asymmetric.
 - Adjustment remains difficult (no fiscal federalism, lower levels of labor mobility).
- Moreover, the evidence suggests that while the euro had positive efficiency effects, that positive supply shock unleashed large capital flows between Northern and Southern Europe, inflating asset prices in the South.
- This lending boom boosted demand in Southern Europe, creating the mirage of prosperity but also leading to a permanent loss of competitiveness.

- Suggesting the need to do something about this capital-flow problem and its effects.
- It's all about financial markets, in other words (as Vítor Constâncio could have told us).

3 So what can be done?

It would be nice to think that Europe could boldly complete its monetary union.

Meaning that it could:

1. Complement its single monetary policy with a single fiscal policy (create a federal fiscal system).
2. Mutualize its debt.
3. Establish a true single labor market.
4. Create a political union to provide accountability for those making these Eurozone-wide fiscal, monetary and labor policies.

But we know that this is not realistic: there is no political appetite for such ambitious steps, certainly not in the short run.

Given this, can we imagine more limited steps that would be effective? In other words, can monetary union without political union be made to work, or if not should we give up the ghost?

I will argue that three steps, all of which are possible without political union, suffice for survival of the euro:

1. Establishing a normal central bank.
2. Completing the banking union.
3. Renationalizing fiscal policy.
4. And making the right kind of progress on political union.

This list is a variant of the argument that “monetary union without banking union, fiscal union and political union will not work.”

But it is not the standard variant.

The starting point for understanding this is to ask: how should we think about organizing the provision of monetary stability, financial stability and fiscal stability (which are what a workable monetary union requires)?

In thinking about provision, a useful framework is “club theory”

When tastes are relatively homogenous, spillovers are significant and there are increasing returns to collective action, decision making should be centralized.

But where spillovers are more limited and tastes are heterogeneous, responsibility should be decentralized.³

Let me now return to my four conditions and how they fit into this framework.

3.1 A normal central bank

I define a normal central bank as one able to pursue flexible inflation targeting and able to backstop banking systems and markets in government bonds, thereby protecting the euro area from self-fulfilling crises.

Theory and evidence argue strongly for centralized provision.

- Spillovers of monetary policy and of doubts about the integrity of the euro area are powerful.
- Preferences over inflation are not that different (er...)

This function was not provided initially.

- The ECB’s two-pillar strategy focused on inflation and monetary aggregates but not lender- and liquidity-provider-of-last resort functions.
- Even inflation targeting was asymmetric.
- In addition, the ECB concentrated on headline rather than core inflation, causing it to raise interest rates in 2008 and 2011.

Things changed under Draghi

- And with “do whatever it takes” in 2012: Outright Monetary Transactions to achieve it.
- Symmetric inflation target: QE with capital key to achieve it.

³ Viz. James Buchanan, “An Economic Theory of Clubs,” *Public Choice* (1965); Viz. *The Principle of Subsidiarity*.

- Given this, what more is now needed to establish a normal central bank?
 - Greater transparency commensurate with greater responsibility and increase in the range of action.
 - A smaller and more nimble Governing Council capable of moving more quickly.

3.2 Completing the banking union

The crisis has underscored how banking-system stability is a euro-area-wide public good subject to strongly increasing returns (spillovers are powerful, in other words).

One need only recall how lax regulation of French and German banks allowing these institutions to lend hand over fist to Southern European countries set the stage for the crisis, or how the subsequent problems of some banks then threatened to destabilize others via the interbank market.

Experience has shown that this is an area where strongly increasing returns from centralized provision dominate any costs of uniformity.

A point that is underscored by these findings: see Figures 7 and 8.

Europe now has half a banking union

Single supervisor:

- But for biggest 130 banks only.
- Adequacy of “federalized” supervision for other banks is unclear.

Bank Recovery and Resolution Directive:

- But is it feasible? Has the Italian problem changed views?

And as yet no harmonized deposit insurance with a common financial backstop.

3.3 Renationalization of fiscal policy

EU approach has been to centralize fiscal policy on the assumption that spillovers are large.

But all the evidence suggests that the spillovers of budget deficits are small.

- Spending and interest rate effects go in opposite directions.
- (There is a distinction between deficits and debts, to which I will return.)

- Even the ECB acknowledges this: see Attinasi, Lalik and Vetlov, “Fiscal Spillovers in the Euro Area,” ECB WP 2040 (March 2017).

And countries clearly have highly heterogeneous tastes regarding fiscal policy.

- All this suggests returning control to the national level.

By which I mean, if not abolishing Europe’s fiscal rules outright, then at least greatly relaxing (“flexibilizing”) them.

Fiscal discipline vs. fiscal transfer

Note that this makes me something of an Anglo-Saxon outlier on the question of what to do about the German fiscal surplus.

This perspective suggests not focusing on this issues, since the cross-border spillovers of fiscal stimulus (public investment) would not be all that great.

Better would be measures to support spending in countries where growth remains slow and unemployment remains high.

Either by writing down debts of heavily indebted countries suffering slow growth and high unemployment so that they regain their fiscal freedom of action, or by creating a system of intra-EU fiscal transfers, a point to which I will return.

But to work, renationalization requires a credible no-bailout rule

Recall how fear of banking crises/failures have repeatedly led to bailouts.

Doing otherwise requires disconnecting the banks from sovereign debt markets and otherwise bullet-proofing their balance sheets.

- Through sovereign concentration charges?
- By adding Europe-wide deposit insurance with a fully-funded backstop.
- Through the creation of safe assets for the banks to hold?
 - I’m much more convinced of the essential nature of the first 2 than the 3rd.

So far so good

But restoring freedom of fiscal action at the national level also requires removing debt overhangs where they inhibit the appropriate fiscal response.

Easier said than done.

- Many schemes have been mooted for a “debt jubilee.”

- But history suggests that major debt write-downs and restructurings only occur during major crises.
- Europe thus may have to wait for its next crisis, or else substitute something else for the missing debt reduction.
- Where that something is an even larger tax-and-transfer system across members, perhaps joined with a centralized fiscal capacity.

I freely acknowledge that there is limited political appetite for such a scheme

But that leaves us with an “impossibility theorem.” The euro area has two options if it is solve its fiscal conundrum:

1. Renationalize fiscal policy, which is “impossible” because of the difficulty of restructuring inherited debts.
2. Create a fiscal capacity at the EU level, which transfers budgetary resources to countries that would otherwise have reason to pursue fiscal expansion, which is “impossible” owing to Northern European opposition to Transfer Union.

In the next crisis, we will perhaps find out which one of these “impossible” options is less impossible.

4 Conclusion

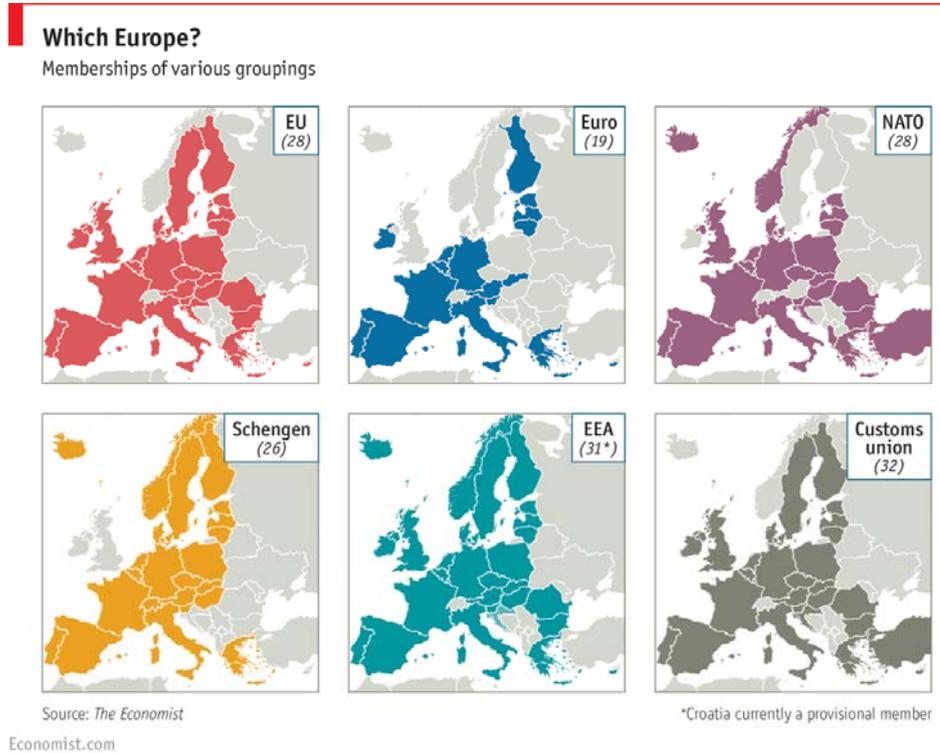
Does the euro area need more integration or less integration?

The euro area needs both. And club theory suggests along what dimensions.

It also suggests that “two-speed Europe” is not on.

- This was proposed by Karl Lamers and Wolfgang Schauble way back in 1994, and it is back, courtesy of Macron and Piketty.
- But this is not the right model.
- Denmark is in the Schengen Agreement but outside the euro; Ireland is in the euro but out of Schengen, etc... (see Figure 9).

Figure 9
Which Europe?



Source: The Economist

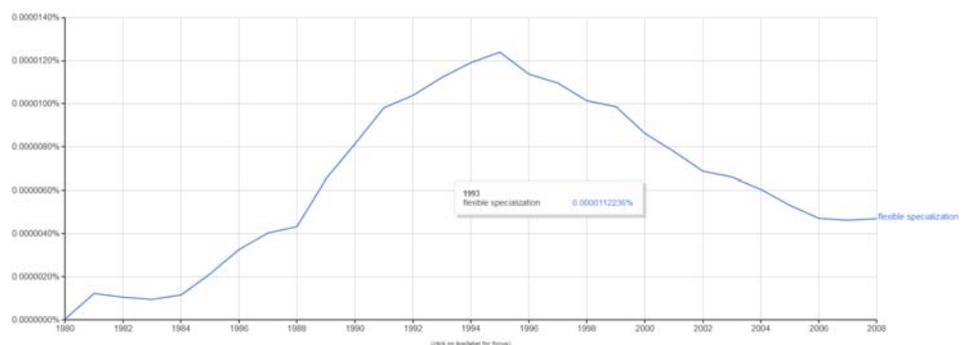
Instead, we are talking about flexible integration

But not even the “5 Presidents Report” really discusses this possible.

Even the term has fallen out of fashion (see Figure 10).

The question is why?

Figure 10
Flexible specialization: search of the term in Google Books



Source: Author's presentation slides.

Answer: governance problems

A strengthened EU and euro area require greater accountability to enhance the legitimacy of European integration and beat back the populist anti-EU reaction.

But the European Parliament is not obviously an adequate vehicle for this.

- It is remote to European voters.
- It contains both countries in and out of the various clubs.

Piketty and coauthors suggest a Eurozone Assembly to be established alongside the EP, to be made up of a selection of MEPs and a selection of national parliamentarians.

Problems

Two is not enough, given that the problem is not simply euro ins and outs.

It assumes that national parliamentarians will have the bandwidth and that national parliaments will rearrange their schedules.

The EU actually tried this before 1979, when the EP was made up of national parliamentarians nominated by their countries. Shortcomings of that system was what led Europe to adopt today's status quo.

Solution: Work within the framework of the European Parliament

Different subgroups of members would vote on different issues, depending on country membership.

If EP was endowed with additional power (to initiate legislation and reject a broader range of directives proposed by the Commission), voters would have less reason for apathy and more reason to pay attention.

Solution: Direct election of the President of the Commission

Current system (where Council selects a candidate and the Parliament confirms) puts two layers of separation between the EU's proto-executive and the people.

Direct election becomes even more important as the president acquires executive powers (over inter alia foreign and security policy).

- Objections: campaign in all 27 member states; linguistic limitations.
- But we have these problems in the US too.

Discussion on “The euro and the theory (and practice) of Monetary Union” by Barry Eichengreen

By Lucrezia Reichlin¹

1 Introduction

In his interesting paper, Barry reaches two grim conclusions.

First, twenty years from the establishment of the European Monetary Union (EMU), the euro-zone is still further from an optimum currency area (OCA) than the US is. This is measured by the degree of asymmetry of demand and supply shocks identified by a set of small Vector Auto Regressive (VAR) models. Barry’s calculations are based on the extension of a highly cited paper written in the early nineties (Bayoumi and Eichengreen, 1993).

Second, while the introduction of the euro had some efficiency effects on the economy, financial integration led to large capital flows from the North to the South of the Union and the inflow of capital led to loss of competitiveness in the South. This is associated with the “boom and bust” dynamics in the so called PIIGS countries²: a warning against the “perils of financial integration”.

In my discussion I will provide some empirics of my own which offer a slightly different perspective.

2 Pre-crisis sample – growth volatility

Figure 1 describes annual GDP per capita growth for the first twelve countries that joined the euro³. I have indicated in dashed red lines the one which are more volatile (“red” countries from now on) and dashed blue lines the more stable ones (“blue” countries from now on). The blue solid line describes the euro area average. This chart is from a paper I co-authored and wrote just before the 2008 crisis (Giannone, Lenza and Reichlin, 2010).

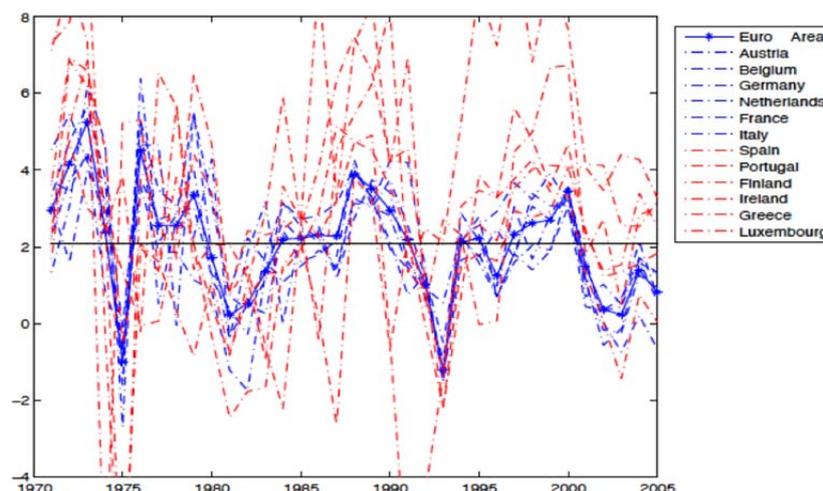
¹ London Business School and CEPR.

² Portugal, Ireland, Italy, Greece and Spain.

³ Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands, Portugal and Spain.

Figure 1
GPD per-head: growth

GDP per-head: growth



Source: Giannone, Lenza and Reichlin (2010).

Writing in 2008 we were observing that countries which are characterized by high volatility have been so before and after the introduction of the euro, suggesting that boom-bust type of dynamics is to be associated with structural characteristics of these countries such as openness, size, quality of regulations or convergence growth rather than the deepening of financial integration associated with the introduction of the common currency.

We also observed that the volatile group – including the “red” countries – does not coincide with the definition of the PIIGS. For example, Italy is not one of them while Finland is.

3 Asymmetric shocks: historical assessment including the crisis

Following Giannone, Lenza and Reichlin (2010) but updating the sample up to 2016, I now want to provide a more formal assessment of asymmetry of business cycle which takes into account estimation uncertainty.

This will help us assess more precisely whether the boom-bust dynamics which Barry associates to financial flows in the euro sample, is specific to the euro sample or if instead is an historical feature associated with the countries in question as Figure 1 suggests.

The high volatility of those countries identified as “red” in Figure 1 suggests that their association with the larger more stable (blue) countries has been historically weak and

has not changed with the euro. Let us now establish the statistical significance of this fact and in a sample which includes the crisis years. This will allow me to identify whether there are different patterns of business cycle association before and after the crisis.

The analysis is based on a Vector Auto Regressive (VAR) model including the annual growth rate of GDP per capita for the twelve countries of interest (defined as $\Delta y_{i,t}$) and the rate of growth of its average weighted by population (defined as $\Delta y_{ea,t}$) estimated on the sample 1971-2007 (pre-crisis sample)⁴. I then compute the expectation of yearly GDP per capita for each member country conditionally on the estimated parameters and the aggregate outcome, that is the entire (1973-2016) path of area-wide aggregate GDP. Defining $\theta_{1971-2017}$ as the parameter estimates, we have:

$$\widehat{\Delta y}_{(i,t|ea)} = E_{\theta_{1971-2007}} [\Delta y_{i,t} | \Delta y_{ea,1971}, \Delta y_{ea,1971}, \dots, \Delta y_{ea,2015}, \Delta y_{ea,2016}].$$

I also compute uncertainty around the conditional expectations, which allows me to assess the statistical significance of the differences between observed country growth rates and their conditional expectations. A significant difference indicates “asymmetry”.

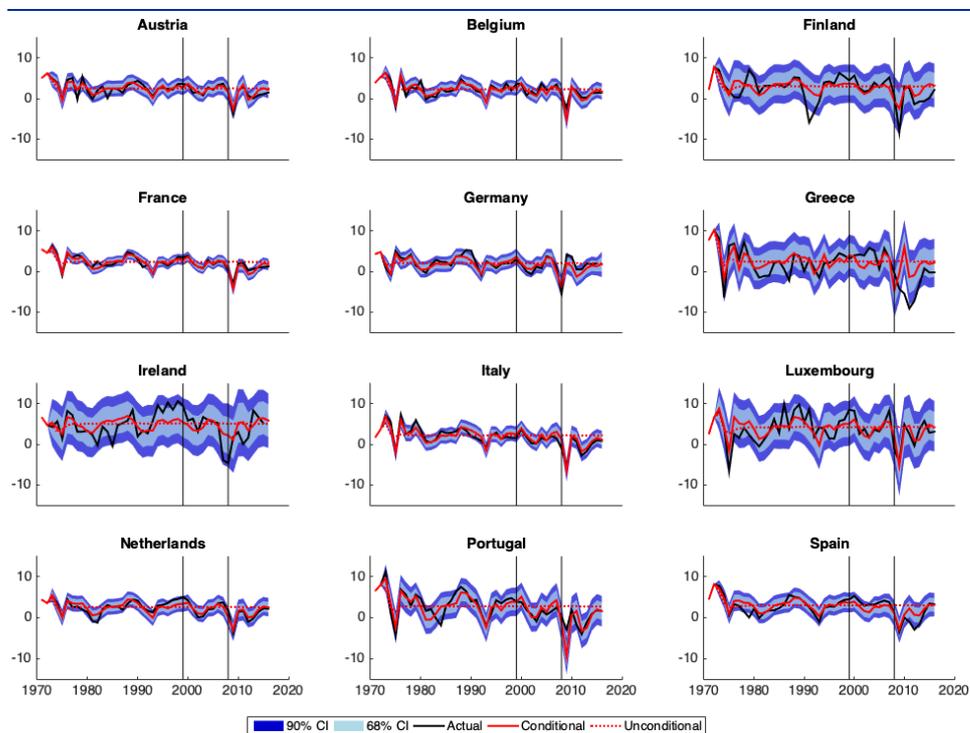
Chart 2 presents the results. I report unconditional forecast (dashed lines), the median of the conditional forecast (red lines), the realization (black lines). We also report coverage intervals at 90% level (dark area) and 68% level (light area). Notice that for the period 1971-2007 we have in-sample estimates while for 2008-2016 out-of-sample estimates.

The vertical lines indicate the introduction of the euro and the beginning of the great recession.

⁴ This is a large Bayesian VAR à la Banbura, Giannone and Reichlin (2010). Hyper-parameters are estimated using Giannone, Lenza and Primiceri (2015) approach. The conditional forecast is computed as in Giannone, Lenza and Reichlin (2010).

Figure 2

Counterfactual – estimation period 1971-2007, conditional forecast sample 2008-2016



Source: Author's calculations – update of Giannone, Lenza and Reichlin (2010).

Few features of the results are worth emphasizing.

First, uncertainty about the association with the average cycle, as measured by the width of the confidence interval, is confirmed for the “red” countries no matter what is the sub-sample considered. The introduction of the euro does not trigger a significant change and neither does the crisis.

Second, the difference between the median of the conditional expectation and observed GDP growth (our measure of “asymmetry”) shows the three features: (i) for the “blue” countries the two lines are very close throughout the sample: neither the crisis nor the EMU triggers significant changes; (ii) “red” countries show phases of growth above the conditional forecast and phases below but in the pre-crisis EMU sample they move closely together with the exception of Greece which in that period grows above conditional expectation; (iii) after the crisis we see larger heterogeneity affecting especially Finland, Greece, Ireland and Spain. Given the large confidence bands for these countries, however, the differences between observed and conditional paths are hardly significant. Interestingly, neither Italy nor Portugal show an “unusual” volatility with respect to their historical standards although both countries grow below their unconditional forecast. But this has been the case since the nineties and therefore indicates a persistent slowdown affecting potential growth rather than a business cycle feature. For both countries this starts before the EMU membership.

It is also interesting to note that Germany is the only country whose output per capita grew above the conditional path since the crisis. Notice that the latter moves on the upper bound of the confidence interval.

4 Risk sharing and nominal and real asymmetries

Let me now introduce two measures of cross-country asymmetry for GDP growth (real asymmetry) and HICP inflation (nominal asymmetry).

Let us define the rate of growth of GDP in country i as Δy_t^i and the rate of growth of HICP inflation as Δp_t^i . Define also the associated average growth rate of the twelve countries which are the original members of the euro area as Δy_t^{ea} for GDP and as Δp_t^{ea} .

The following expressions measure, respectively real and nominal cross-country asymmetries:

$$E(\Delta y_t^i - \Delta y_t^{ea})^2$$

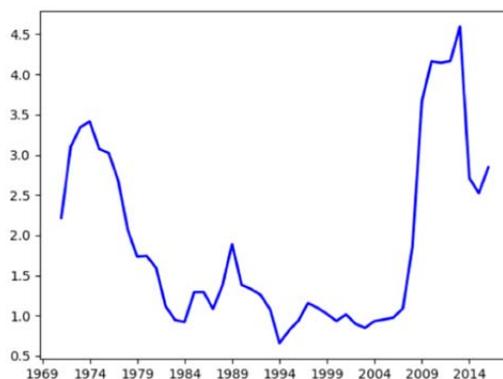
with $i = 1, \dots, 12$

$$(E\Delta p_t^i - \Delta p_t^{ea})^2$$

Figure 3a (real asymmetry) and 3b (nominal asymmetry) report results for the sample 1969-2017.

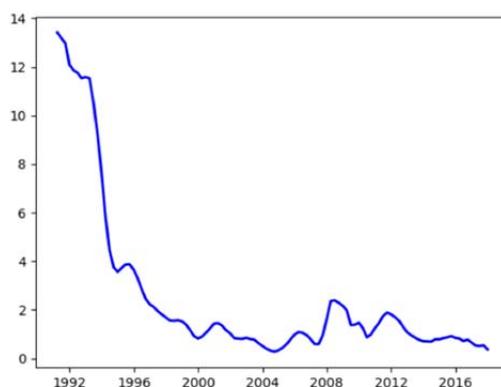
As noted by Kalemli-Ozcan, Sorensen and Yosha (2001), under some simplifying assumptions, the real asymmetry definition can be used as a measure of the gains from risk sharing. This is explained as follows. In the extreme case in which the countries that are members of the monetary union are able to fully share risk, only area wide fluctuations matter and asymmetries are painless. At the other extreme, if countries are autarkic, they are forced to consume at each point in time what they produce and asymmetries are painful. How economically important asymmetries are depends on how close we are to autarky.

Figure 3a
Real asymmetry



Source: Author's calculations.

Figure 3b
Nominal asymmetry



Source: Author's calculations.

Nominal and real asymmetries have a very different pattern.

By 2000 inflation has converged to a very low level of asymmetry and stayed at that level throughout the crisis. Nominal convergence can be attributed to the credibility of the price stability mandate of the ECB and to the global low inflation environment experienced since the late eighties – early nineties. This is not a factor that is considered in the OCA literature, but one that it is important to understand EMU countries macroeconomic adjustment.

As for GDP, for which we report the measure for a longer sample, we can identify three periods: the volatile period of the seventies and early eighties, the great moderation and the great recession. If we take the real measure of asymmetry as an indicator of the degree of risk sharing, we can conclude that the latter increased with the great moderation but jumped up again with the great recession.

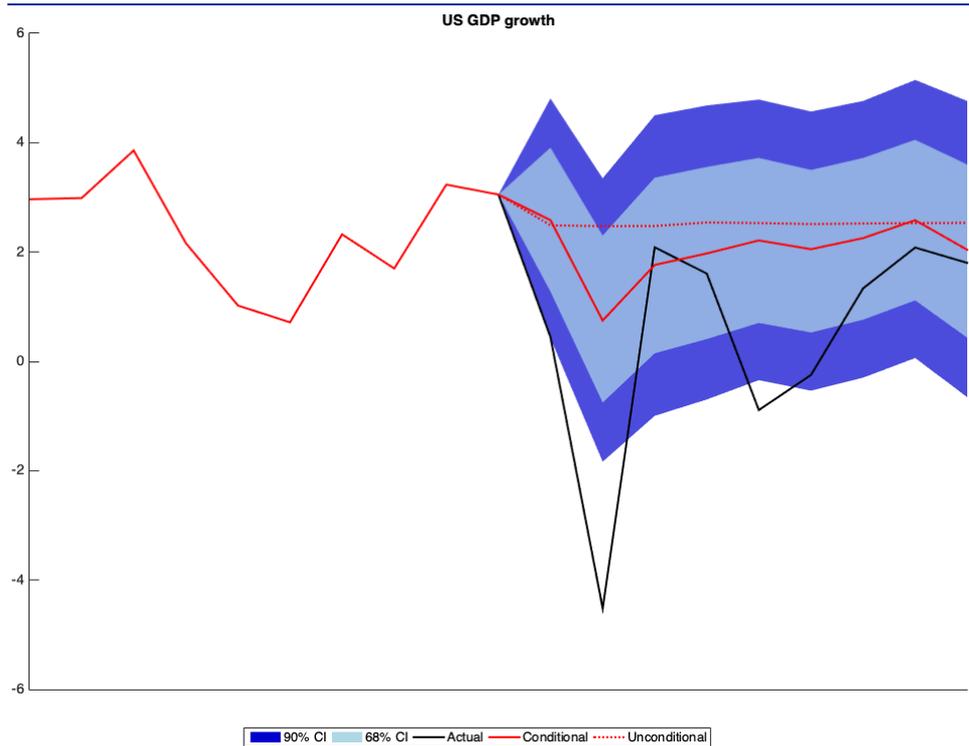
In a different framework we confirm results from the counterfactual exercise: cross-country heterogeneity increased as a result of the “big” shock of the great recession and is not related to the establishment of the euro.

5 The euro area and the US

My final piece of evidence is about the correlation between GDP per capita growth in the euro area and in the US. This is a measure of aggregate performance. I will use again a conditional forecast tool.

I will estimate a bivariate US-euro area model for 1971-2007 (pre-crisis sample), then compute the conditional forecast of the euro area GDP given estimates of the parameters and observed US GDP for 2008-2016 and finally establish whether the median of the conditional forecast of euro area GDP per capita growth and its realized path for 2008-2016 are significantly different. Results are reported in Figure 4.

Figure 4
Conditional forecast – aggregate euro area GDP per capita annual growth



Source: Author's calculations.

Not surprisingly, the observed path of euro area average per capita GDP growth is below what we could have expected given the US path and the pre-crisis correlation between US and euro area GDP growth. In particular, the second recession of 2011-2012 could have not been anticipated. This suggests that the policy response to the 2008 crisis was not as effective in the EMU. Several explanations have been discussed in the literature: pro-cyclical fiscal policy, lack of common tools for banks

resolution, redenomination risk motivated by uncertainty on the commitment to defend the integrity of the common currency.

6 What have we learned?

Let us now reflect on the implications of these results.

The exercises I proposed here reveal that the high volatility of some of the smaller and converging countries of the euro makes measure of asymmetry based on point estimates not reliable.

These countries have been characterized by booms and busts dynamics and weak association with the aggregate euro business cycle way before the introduction of the euro and no change is identified with it. The great recession of 2008 and the subsequent euro area debt crisis, however, trigger more asymmetries. The latter are visible but not statistically significant given the history of weak association of these countries' business cycle with the average.

An alternative measure of asymmetry which, under some conditions, can be considered a measure of risk sharing, confirm the importance of the great recession as a trigger of heterogeneity and point to a dramatic decrease in cross-country risk sharing. This materialized in a situation where inflation heterogeneity stayed low, a fact that implicitly points to an increase in the dispersion of nominal-real correlations during the crisis.

This leads to three conclusions.

The euro area was and is made of heterogeneous countries. My results, although based on a different analysis, agree with the assessment by Barry that asymmetries are large. However, I do not support the view that the asymmetries have increased with the EMU inception. For this reason, results do not support a "story" based on the idea that financial integration associated with the euro generated boom and bust dynamics. Countries that were volatile in the eighties are still volatile today. This point to explanations based on weak institution, poor regulations or degree of openness rather than simply financial integration. The question whether is desirable for these countries to join a currency area depends on whether the euro membership offers an opportunity for higher risk sharing and better regulation decreasing the vulnerability to exogenous shocks.

The second remark is whether real asymmetry really tells us something about the desirability of the EMU. As shown in Section 4, the euro experimented nominal convergence without an increase in the volatility of output. The role of stable inflation and central bank credibility is not something that the OCA literature considered, but must have created a favorable environment for reform.

Finally, after the volatile seventies our results show that the euro area has experienced a dramatic increase in the degree of risk sharing and it is only with the great crisis that we saw a reversal. This points to the importance of the crisis as a trigger for an

increase in heterogeneity and decrease in risk sharing. Given the previous comments, we can conclude that this was not the result of the euro per-se or financial integration per-se but rather the policy response to the crisis which penalized certain countries and the euro area as a whole. The final exercise, in which we consider aggregate performance, show that, based on the historical pattern of US-euro area business cycle correlation, the euro area should have had a better crisis. The conjecture is that if, collectively, stabilization tools had been used more effectively, EMU would have had a better crisis. We should then conclude that it is not the inevitable forces of the common currency that make countries fragile but a still inadequate economic governance.

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Core periphery relations in the eurozone

By Paul De Grauwe¹ and Yuemei Ji²

1 Introduction

Sometimes a picture is worth 1,000 words. This is the case with Figure 1 which shows the 10-year government bond spreads of the countries that entered the Eurozone in 1999 (Greece in 2002). The spreads are defined as the difference between the 10-year government bond yields of a particular country and the German 10-year government bond yield.

We observe dramatic changes during 1999-2017. During the 1990s the spreads were large but declining as the date of the start of EMU approached. During that period these spreads reflected mainly devaluation risks. At the moment the countries entered the Eurozone, these spreads all but disappeared as the devaluation risks had dissipated.

The financial crisis that erupted in 2008 was a wake-up call in the government bond markets of the Eurozone and led to large increases in the spreads. Suddenly the financial markets discovered that there were also liquidity and solvency risks attached to the holdings of sovereign bonds in the Eurozone. The spreads of a number of countries surged reflecting these risks that financial markets had forgotten about. These were the risks that the sovereigns in a monetary union can run out of cash and be driven into default.

It is immediately clear from Figure 1 that the countries whose currencies experienced devaluation risks in the 1990s were also the countries that experienced sovereign debt crises in 2010-12. The question we want to analyze here is the following. Are the devaluation risks of the 1990s good predictors of the sovereign debt risks that emerged during the Eurozone crisis of 2010-12?

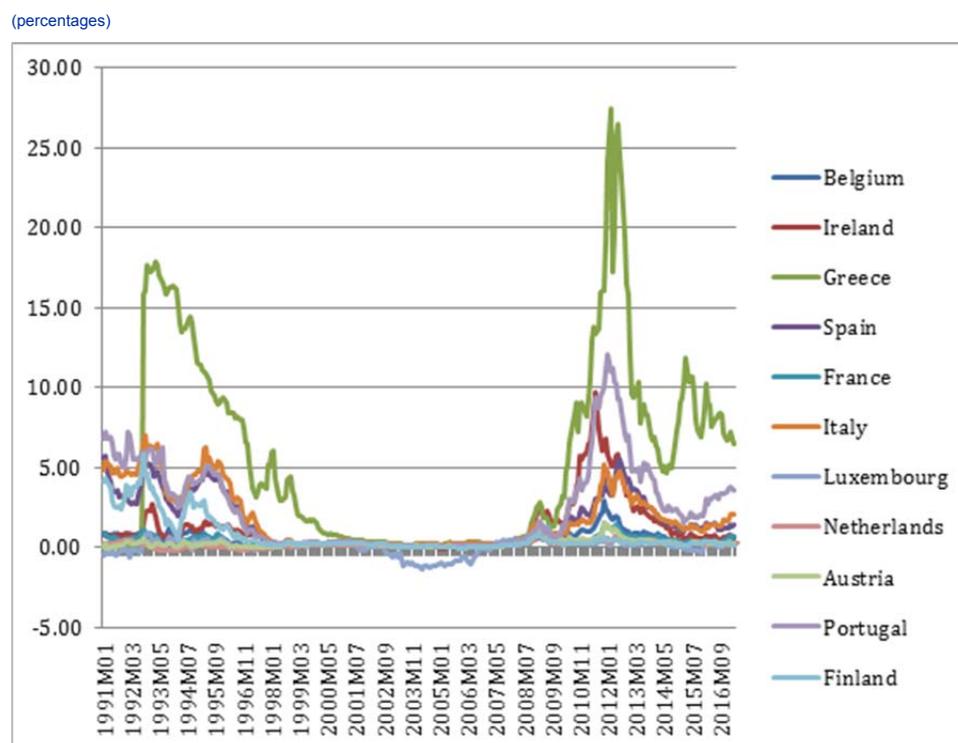
This question can be phrased somewhat more provocatively as follows: did the sovereigns that got into trouble during the sovereign debt crisis of 2010-12 carry an “original sin”³ that, during the 1990s, showed up in the form of frequent foreign exchange crises?

¹ London School of Economics.

² University College London. Paper prepared for the Conference “The future of central banking. An ECB colloquium held in honour of Vítor Constâncio”, Frankfurt, 16-17 May, 2018. We are grateful to Jean Pisani-Ferry and participants at the conference for comments and suggestions.

³ The concept of “original sin” has been applied by Eichengreen, et al. (2002) to characterize the fragility of Latin-American sovereigns forced to issue debt in dollars.

Figure 1
Spreads of 10-year government bond yields vis-à-vis Germany (1991-2017)



Source: Eurostat.

In this paper we try to answer this question. The question is important because if the answer is positive there is a lot of determinism about the question of whether countries belong to the periphery and thus are likely to get in trouble in the future again. It is very difficult to escape an “original sin”.

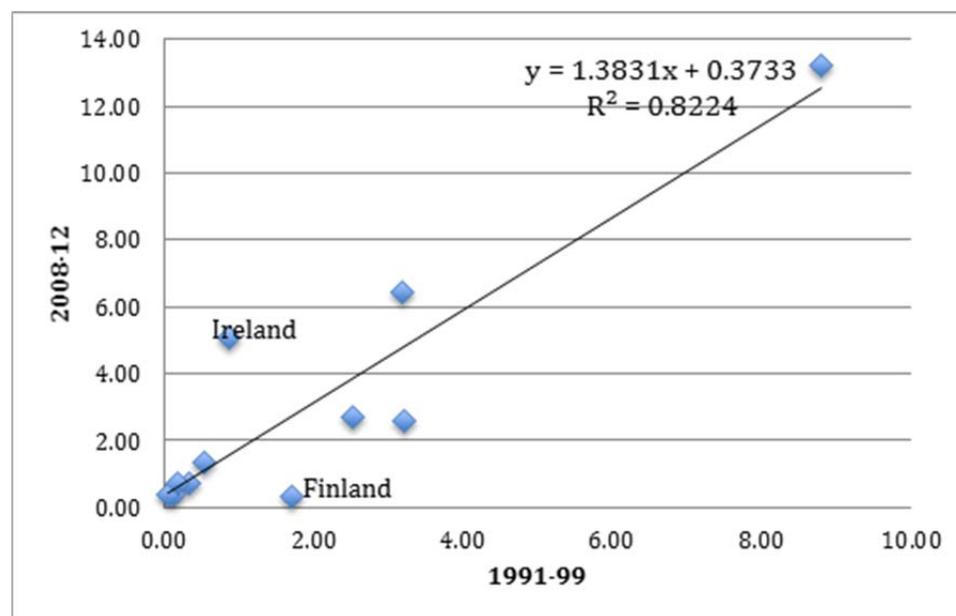
This analysis will lead us to study the fragility of the Eurozone and to discuss how the Eurozone can be stabilized.

2 Is there an original sin?

In order to answer this question we correlate the spreads observed during the 1990s and those observed during the financial crisis. We plot the results in Figure 2. On the horizontal axis we show the mean spreads during 1991-99 and on the vertical axis the mean spreads during the period 2010-12. We find a strong correlation, i.e. the spreads observed in the 1990s are good predictors of the spreads observed during the sovereign debt crisis in the Eurozone. Thus, countries that got into trouble during the foreign exchange crises in the 1990s are broadly the same as those that got into trouble during sovereign debt crisis. In addition, the intensity of the foreign exchange crises is highly correlated with the intensity of the subsequent sovereign debt crisis. This is quite remarkable because it took 10 years for this correlation to appear. Everybody seems to have been sleeping unaware of these simmering risks.

Figure 2
Bond spreads 1991-99 and 2010-12

(percentages)



Source: Own calculations using Eurostat data.

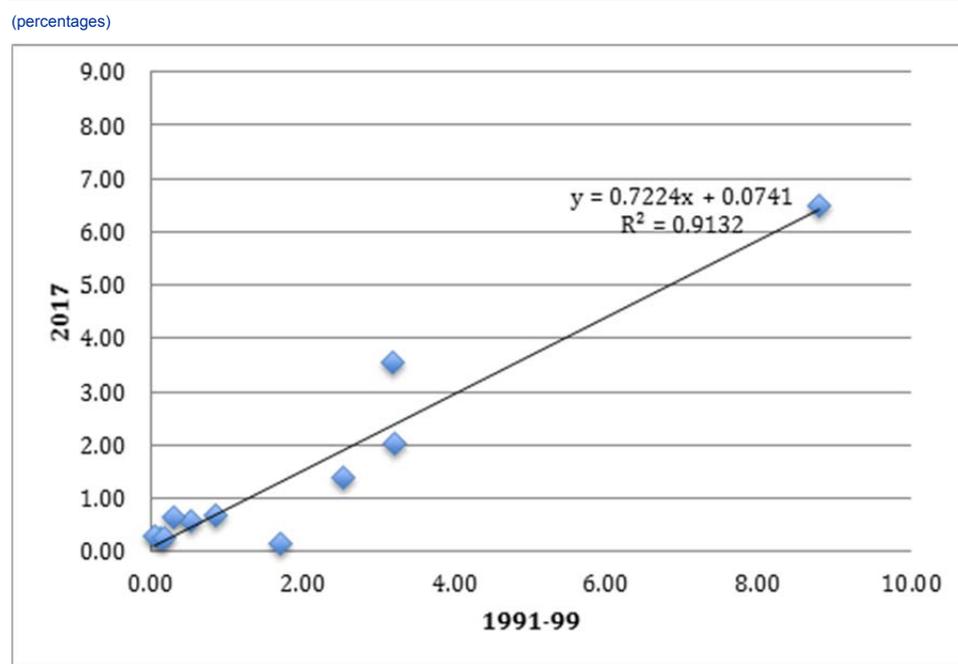
Thus, from the preceding analysis it appears that the “periphery” countries that appear both in the group of countries experiencing devaluation risks in the 1990s and in the group of countries hit by sovereign debt crises carry the burden of some “original sin”. The latter appears to drive them into foreign exchange crises when they have a fixed exchange rate and into sovereign debt crises when they are in a monetary union.

Before analyzing the nature of this “original sin” it is worth asking the question of whether there are exceptions to this correlation of foreign exchange and sovereign debt crises. The answer is, yes, there are. We show the cases of Ireland and Finland in Figure 2. Ireland was not among the group of countries experiencing foreign exchange crises in the 1990s, yet it was drawn into a severe sovereign debt crisis in 2010. Thus in a way Ireland got drawn into a sovereign debt crisis, without having “sinned originally”. The reverse is true for Finland. Despite foreign exchange crises in the 1990s Finland did not experience a sovereign debt crisis. It looks like Finland escaped from the “original sin”. We conclude that one should not apply the Calvinistic theory of “predestination” here: countries with an original sin can find redemption; countries without original sin can be punished by a sovereign debt crisis. We come back to this issue when we ask the question how strong this original sin is.

Did the original sin continue to do its work after 2012, the year when the ECB saved the Eurozone with its OMT-program? We give an answer in Figure 3. This shows the same spreads during the 1990s on the horizontal axis and the average spreads in 2017, five years after the end of the sovereign debt crisis. It is now clear from this figure that the correlation is at least as strong as in Figure 2. Thus it appears that on average countries that in some distant past have committed sins continue to be

punished for a long time. What then is the nature of this original sin? We turn to this question in the next section.

Figure 3
Bond spreads 1991-99 and 2017



Source: Own calculations using Eurostat data.

3 The nature of the original sin: the German School

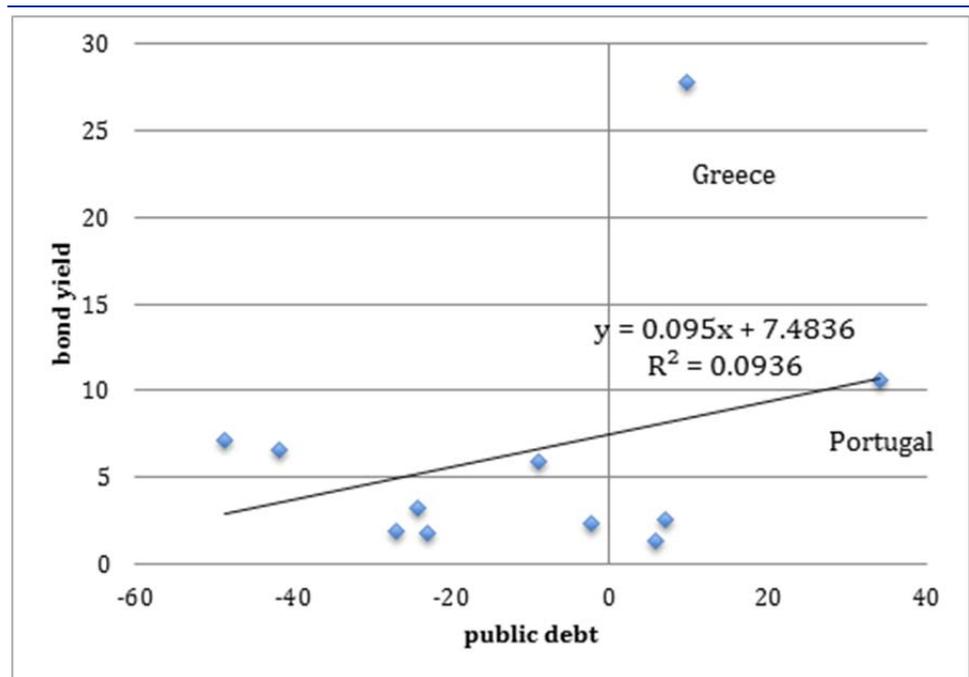
Why do some countries appear to carry the burden of the original sin for so long? Here is the German answer. When political and legal institutions are weak it is difficult to maintain fiscal discipline. That in turn leads to macroeconomic and monetary instability, characterized by large government deficits and increasing government debt. When countries with weak governance issue their own money, this will typically lead to high and variable inflation, leading to depreciating currencies. When these countries peg their exchange rates, as many EU-countries did in the 1980s and 1990s, this leads to frequent speculative crises followed by devaluations. Finally, when these countries join a monetary union without strengthening their political institutions, the pressure will be mainly on the government finance. Ultimately, this will lead to a sovereign debt crisis. In this view; the crises have the same source: weak governance.

This German view has provided the analytical framework for the Stability and Growth Pact that is deemed to be essential in disciplining national governments in a monetary union. It is probably the most influential analysis of the question of why some countries end up in the periphery, and others in the core. But is it really convincing? It is, we would expect that Eurozone countries that accumulated a lot of government debt prior to the sovereign debt crisis also were hit most by this crisis when it erupted in 2010. In other words, we should find that the public debt accumulation is a good predictor of the

subsequent sovereign debt crisis. In Figure 4 we show some evidence. On the horizontal axis we set out the change in public debt (in percent of GDP) of member countries during 1999-2007, the period preceding the financial crisis. We observe that most of the Eurozone countries saw their public debt decline prior to the crisis. On the vertical axis we set out the government bond yields of the same countries in 2012, when the sovereign debt crisis was at its peak. It is our measure of the intensity of the sovereign debt crisis. We observe that the public debt accumulation prior to the crisis is a weak predictor of the subsequent sovereign debt crisis.

Next we asked the question of whether private debt accumulation prior to the crisis is a better predictor of the sovereign debt crisis. The answer is given in Figure 5. On the horizontal axis we show the change in private debt prior to the crisis (as a percent of GDP); on the vertical axis we present the same measure of the intensity of the sovereign debt crisis, i.e. the yields on 10-year government bonds in 2017. We note that contrary to the public debt, the private debt increased significantly before the eruption of the crisis.

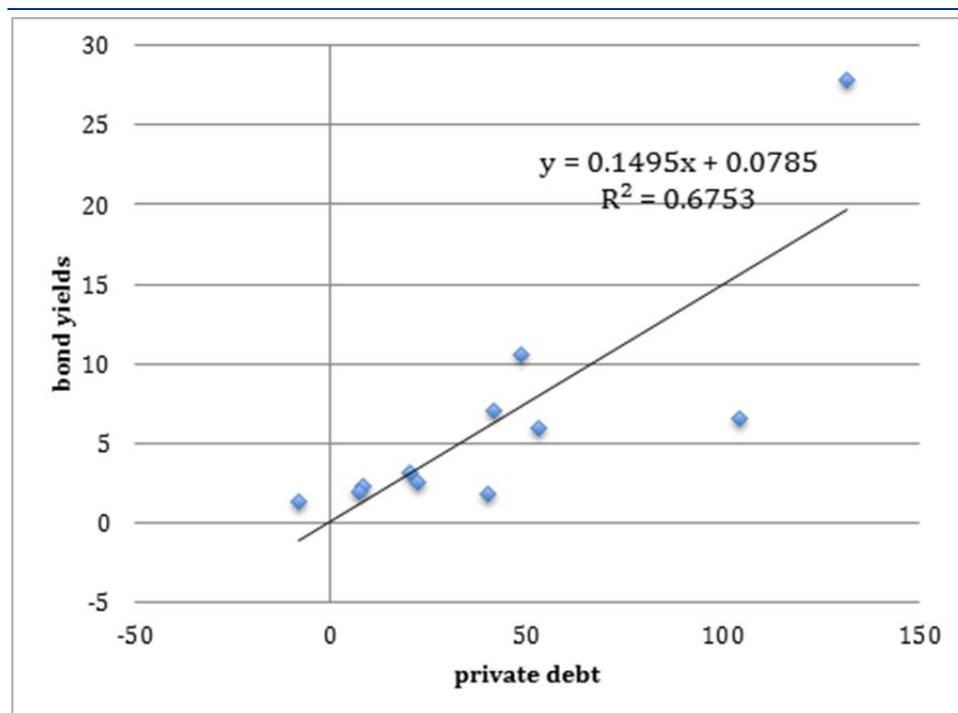
Figure 4
Government bond yields (2012) and increase government debt (1999-2007)



Source: Eurostat.

Figure 5

Government bond yields (2012) and increase private debt (1999-2007)



Source: Eurostat.

We find quite surprisingly that private debt accumulation before the financial crisis is a good predictor of the sovereign debt crisis, i.e. those countries that tended to accumulate more *private* debt before the crisis were more likely to experience a *public* debt crisis later. That does not seem to give much support to the German discipline school. Only the cases of Greece and Portugal seem to be consistent with this school of thought. We observe that in these two countries both private and public debt increased significantly (in both cases, however, private debt increased faster than public debt).

From the preceding we conclude that, with the possible exception of Greece and Portugal, the “low-discipline-original-sin” may explain the foreign exchange crises of the 1990s but fails to explain the sovereign debt crises that emerged in 2010. The latter may have little to do with an original sin condemning periphery countries to be hit by a sovereign debt crisis⁴.

How can we make sense of this? We attempt to answer this question in some detail in the next section, but here is the bottom line. The financial crisis that erupted in 2008 was a classical case of a boom-bust that capitalism has produced quite often in history. These classical boom-bust episodes have been analysed by, among others, Kindleberger (1978) and Minsky (1986). During the boom phase optimism and euphoria dominate, blinding consumers and investors in perceiving risks. As a result,

⁴ In De Grauwe and Ji (2012) we provide econometric evidence supporting the hypothesis that fundamental budgetary variables, such as the government debt ratios perform poorly in explaining the dramatic increases of the government bond yields during 2010-12.

consumption and investment soar, made possible by excessive bank credit granted by equally euphoric bankers. This typically leads to bubbles in asset markets, until the crash hits. Then many consumers and firms (including banks) are saddled with unsustainable debt. A process of deleveraging is set in motion leading to a deep recession. That's when governments have to step in in order to save the market system. Banks and firms have to be rescued, unemployed have to be paid, leading governments to issue debt. The countries that have experienced the most intense booms and bubbles also experience the deepest crashes, forcing the governments of these countries to issue an unsustainable level of public debt. In a monetary union such a boom-bust scenario leads to additional problems to which we now turn. We keep in mind though that maybe something else is going on than an original sin determining the fate of periphery countries in the Eurozone.

A note of warning is in place here. The preceding does not mean that some countries of the periphery may not have deep-seated governance problems. They have. It means that these governance problems are not good predictors of the sovereign debt crises that erupted in 2010.

4 Booms and busts in the Eurozone

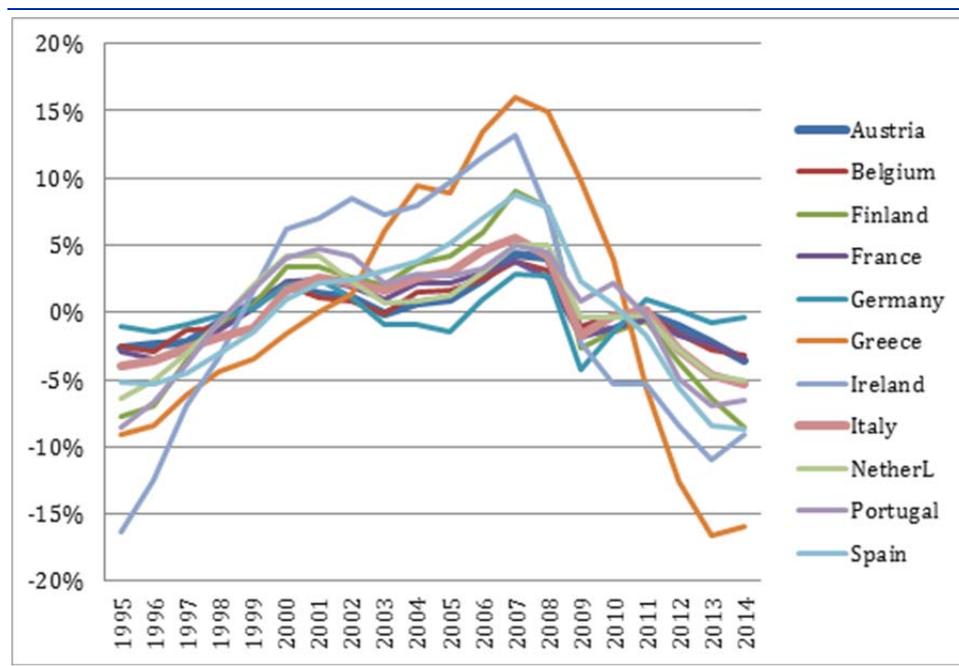
It is well-known that monetary unions cannot easily deal with asymmetric shocks (Mundell (1961)). The surprising thing is that the nature of the asymmetric shocks that hit the Eurozone has been quite different from the traditional asymmetric shocks analyzed in the OCA-literature. In fact business cycles in the Eurozone have been relatively well synchronized. This is shown in Figure 6.

We observe that most Eurozone countries were booming in the period 2000-07 and experienced a downturn since then. If there was asymmetry it was in the amplitudes of the same cycle. Some countries (Ireland, Spain, Greece) experienced a very strong boom and later a deep and protracted recession. Other countries (Belgium, Germany, France, Italy, Netherlands) experienced a much more modest period of booming conditions followed by less intense recessions. Germany stands out as having experienced booms and busts with the lowest amplitude.

If there is asymmetry in the business cycle movements in the Eurozone it is in the amplitude of these cycles. This asymmetry led to a situation in which countries in the group experiencing the highest amplitudes first experienced an unsustainable boom, often accompanied by asset price bubbles and when the crash came, were hit very hard with deep recessions, leading to an explosion of government debt.

The problem with the monetary union lies in the fact that it had great difficulties in dealing with the asymmetric occurrence of these boom-bust scenarios, for two reasons.

Figure 6
Business cycle component of GDP



Source: Eurostat.
Note: the business component is obtained by applying a HP-filter to observed GDP.

First, the European monetary union lacks a mechanism that can deal with boom-bust scenarios with different amplitudes. These lead to divergent developments with large external imbalances, which crystallize in the fact that some countries built up current account deficits and other current account surpluses.

When these imbalances had to be redressed, it appeared that the mechanisms to redress these in the Eurozone (“internal devaluations”) are very costly in terms of growth and employment, leading to social and political upheavals. Countries that have their own currency and that are faced with such imbalances can devalue or revalue their currencies. In a monetary union, countries facing external deficits are forced into intense expenditure reducing policies that inevitably lead to rising unemployment and much hardship to millions of people. This problem has been recognized by the economists that pioneered the theory of optimal currency areas (Mundell (1961), McKinnon (1963), Kenen (1969)).

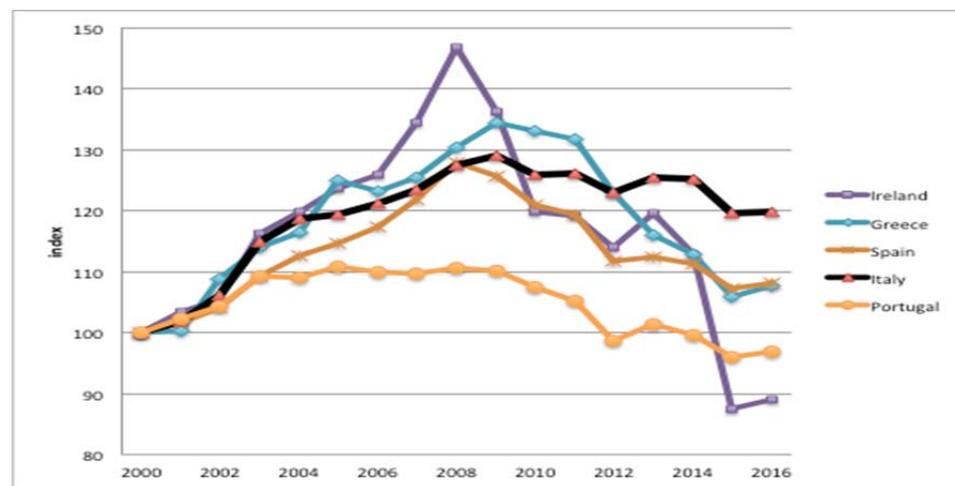
In Figures 7 and 8 we show one dimension of these imbalances. Figure 7 shows the evolution of the relative unit labour costs in the periphery countries. It shows how these countries experienced a massive reduction in competitiveness (increase in relative unit labour costs) produced by unsustainable booms that tended to raise prices and wages relative to other member countries. After the crash they were forced to adjust with large internal devaluations. These introduced strong deflationary forces leading to deep recessions and large increases in unemployment. From Figure 8 we observe that the core countries did not lose competitiveness during the boom years. After the crash they also did not reflate their economies which would have led to internal revaluations. As a result, the whole of the adjustment costs was borne by the periphery (deficit) countries.

That's when the second problem of the Eurozone stepped in. As stressed by De Grauwe (2011) the fragility of the Eurozone arises from the fact that member countries of the monetary union issue debt in a currency they have no control over. As a result, the governments of these countries can no longer guarantee that the cash will always be available to roll over the government debt. This lack of guarantee provided by Eurozone governments in turn can trigger self-fulfilling liquidity crises (a sudden stop) that can degenerate into solvency problems. When this occurs it leads to a massive outflow of liquidity from the problem countries, making it impossible for the governments of these countries to fund the rollover of their debt at reasonable interest rate.

This dynamics can force countries into a bad equilibrium characterized by increasing interest rates that trigger excessive austerity measures, which in turn lead to a deflationary spiral that aggravates the fiscal crisis (see De Grauwe (2011) and De Grauwe and Ji (2012)). This is exactly what happened during the sovereign debt crisis in 2010-12. Markets singled out these countries, leading to massive capital outflows from the first group of countries to the second one. The whole of the Eurozone was destabilized. This problem risks popping up each time the Eurozone is pushed into a recession. Each time some countries will be hit more than others. As a result, large internal capital flows risk further destabilizing the system.

Figure 7
Relative unit labour costs in periphery Eurozone

(2000=100)

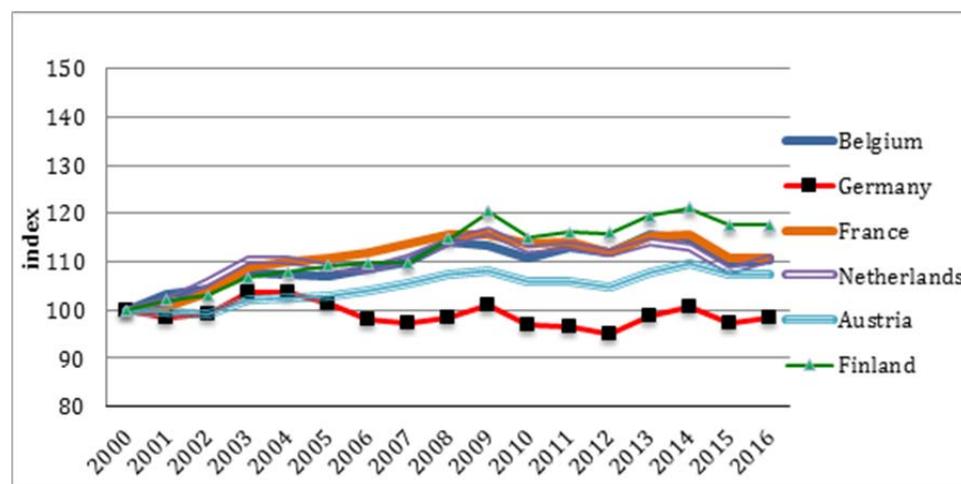


Source: European Commission, AMECO.

Figure 8

Relative unit labour costs in core Eurozone

(2000=100)



Source: European Commission, AMECO.

This episode also illustrated how unstable government bond markets in a monetary union can become in the absence of a backstop provided by a central bank. This is illustrated by the surge in the spreads in those countries that had been hit most severely by the crash.

The absence of a backstop for the sovereign in a monetary union also creates the possibility of generating a “deadly embrace” between the sovereign and the banking sector. When the sovereign is pushed into a bad equilibrium it becomes very likely that the domestic banks will experience solvency problems because they are the major holders of the sovereign bonds. A hellish doom loop is set in motion where the sovereign debt crisis engenders a banking crisis. The reverse causality is equally possible, as the Irish crisis has demonstrated: a domestic banking crisis forces the sovereign to step in to save the banking system. This typically requires the government to take on more debt thereby creating a risk of insolvency.

From the preceding discussion we conclude that, with the possible exception of Greece and Portugal, the countries that were hit by the sovereign debt crisis in 2010 did not carry a burden of some “original sin” produced by weak political institutions that made it impossible for them to avoid the crisis in the Eurozone.

5 There is no original sin

The next question then is why we found the high correlation between the foreign exchange crises of the 1990s and the sovereign debt crises of 2010-12. A possible answer runs as follows. The countries that experienced foreign exchange crises in the 1990s were indeed countries with a history of high and variable domestic inflations. This also had led to high real interest rates that incorporated a high risk premium. When these countries were selected to enter the Eurozone, real interest rates started a process of steep declines. Such a decline did not occur in the countries with low

inflation. As a result, at the start of the Eurozone a major asymmetric shock occurred. Countries of the periphery (high inflation countries) were hit by a large decline in real interest rates. The latter had the effect of boosting their economies. In some of these countries this created an unsustainable boom, leading to a crash with all the consequences discussed earlier. This shock did not occur in the core countries.

Thus, in a way the correlation we observed in Figure 2 and 3 is to a large extent a spurious one. The missing variable is the asymmetric shock in the real interest rate that had the effect of pushing the periphery countries into an extreme boom-bust dynamics and forced the governments of these countries to increase their debts so as to save the market system in these countries. There is no need to invoke some dark force coming from weak governance and that condemned these countries onto a path of sovereign default once in the monetary union.

The preceding discussion makes clear that there is no deterministic law that ensures that the periphery countries will always be in the periphery and that the core countries are safely nested in the core. There are no “original sins”. Capitalism will continue to produce booms and busts and the impact of these booms and busts will continue to be different. We do not know which country will be on the right side of the fence in the next boom-bust phase. It could very well be some core countries that turn out to become periphery countries.

What the previous discussion also makes clear is how unprepared the Eurozone was, and still is, to deal with boom-bust scenarios with different amplitudes. How should the Eurozone be reformed to ensure it is better able to withstand such a dynamics?

6 Redesigning the Eurozone

We identified two problems of the Eurozone. The first one arises from the fact that it has poor instruments to deal with asymmetric shocks. We will call this the OCA-problem. The second problem arises from the instability of the government bond markets in the Eurozone.

6.1 How to deal with the OCA problem?

The standard response derived from the theory of optimal currency areas is that member countries of a monetary union should do structural reforms so as to make their labour and product markets more flexible. By increasing flexibility through structural reforms the costs of adjustments to asymmetric shocks can be reduced and the Eurozone can become an optimal currency area. This has been a very influential idea and has led Eurozone countries into programs of structural reforms.

It is often forgotten that although the theoretical arguments in favour of flexibility are strong the fine print of flexibility is often harsh. It implies wage cuts, less unemployment benefits, lower minimum wages, easier firing. Many people hit by structural reforms, resist and turn to parties that promise another way to deal with the

problem, including an exit from the Eurozone. From an economic point of view flexibility is the solution. From a social and political point of view flexibility can become a problem. Stressing flexibility too often as the way out of the conundrum risks creating enemies of the monetary union that as time moves on leads to an increasing political momentum favoring an exit from the union.

The traditional OCA-analysis is based on the assumption that asymmetric shocks are typically permanent and structural in nature (a change in preferences, a supply shock). We have found, however, that most of the shocks hitting the Eurozone have been temporary and the result of a boom-bust scenario. They are also typically demand shocks. In De Grauwe and Ji (2016) we provided further evidence that business cycle shocks, albeit with different amplitudes, have been the dominant forces.

The implications for the governance of the Eurozone from the finding of the overwhelming importance of the cyclical and temporary component of output growth is that efforts at stabilizing the business cycle should be strengthened relative to the efforts that have been made to impose structural reforms. We are not implying that structural reforms are unnecessary, but rather that efforts at creating mechanisms aiming at stabilizing the Eurozone business cycles should be strengthened.

Inter-country versus inter-temporal smoothing

There have been many proposals made to create a fiscal space at the Eurozone level in the form of a common unemployment insurance system (see e.g. the Four Presidents report(2012), Enderlein, et al. (2012), Beblavy, et al. (2015), Alcidi and Thirion (2015), Benassy-Quéré, A., et al. (2018))⁵.

Such an insurance system has both an inter-country and an inter-temporal insurance dimension. The inter-country dimension is easier to deal with. It is also the one that has received most of the attention in the past. When one country experiences a recession, and thus increasing unemployment, the other country experiences a boom, and declining unemployment. This facilitates the workings of the common unemployment insurance system. The booming country transfers resources to the country in a recession and thereby smoothens the business cycles in the two countries. Technically and politically such a system encounters relatively few problems.

Problems arise when business cycles are relatively well synchronized but of very different amplitude in the different member countries. In that case most countries will tend to experience a recession at about the same time, but in some countries the recession will be mild in other very intense. This creates both an economic and a political problem. First, countries with a mild recession are asked to transfer resources to countries experiencing a stronger recession. This tends to reduce the intensity of the recession in the latter country at the expense of making it more intense in the

⁵ There is an older literature making similar proposals. See e.g. Italianer and Vanheukelen (1992), Hammond and von Hagen (1993) and Mélitz and Vori (1993).

former country. It is not clear that this is welfare improving. Second, it is likely to create important political problems in the former country that is asked to transfer resources when the economy is not doing well.

The previous analysis suggests that common unemployment insurance schemes should put sufficient emphasis on smoothing over time. This can be achieved by allowing the common unemployment insurance scheme to accumulate deficits and surpluses over time. The fiscal rule that could be imposed is that the insurance scheme balances over the business cycle.

In principle, inter-temporal smoothing could be done at the national level, by allowing the national budgets to do the job. However, the large differences in the amplitude in the business cycle movements makes such a purely national approach problematic, as it leads to large differences in the budget deficits and debt accumulation between countries. These differences quickly spillover into financial markets when countries that are hit very hard by a downward movement in output are subjected by sudden stops and liquidity crises. This is likely to force them to switch off the automatic stabilizers in their national budgets (De Grauwe and Ji (2017)). In addition, these liquidity outflows are inflows in some other countries in the monetary union, typically those that are hit least by the recession⁶. Their economic conditions improve at the expense of the others. Stabilization of common business shocks with different amplitudes at the national level makes the system unstable.

National stabilization efforts do not work and introduce an element of instability in a monetary union, mainly because it leaves the countries most hit by the business cycle shocks unable to stabilize. Thus when business cycle shocks dominate it will be necessary to follow a common approach to the stabilization of the business cycles. A budgetary union can provide this. By centralizing part of the national budgets into a common budget managed by a common political authority, the different increases in budget deficits following from a (common) recession translate into a budget deficit at the union level. As a result, the destabilizing flows of liquidity between countries disappear, and the common budgetary authority can allow the automatic stabilizers in the budget to do their role in smoothing the business cycle. In fact, because a common budget also generates implicit inter-country transfers the countries with the deepest recession will profit from the automatic stabilizing features of the common budget most. As a result, a common budget provides the most effective way to stabilize the business cycle.

The previous discussion illustrates that there is an interaction between what we have called the OCA-problem and the fragility problem. It is because the government bond markets lack a backstop that they become unstable during recessions. This makes it impossible to use the automatic stabilizers at the national level, forcing the monetary union to provide stabilization at the union level.

⁶ This is confirmed by the empirical work of Furceri and Zdzienicka (2013) and Hoffmann and Nitschka (2012) who find that during recessions risk sharing through financial markets declines dramatically.

6.2 How to deal with the instability of the government bond markets?

Let us now turn to the question of how to deal with the second problem of the Eurozone, the instability of the government bond markets.

The ECB has a central role to play here. By promising to provide unlimited support in the government bond markets in times of crisis, it can stop liquidity crises that are likely to emerge each time the Eurozone experiences a recession; liquidity crises that destabilize the system leading to large capital outflows from some country to other countries in the same monetary union.

The ECB recognized this problem when it started its OMT-program in 2012. This certainly helped to pacify financial markets at that time and avoided the collapse of the Eurozone. We can clearly see from Figure 1 that when the OMT-program was announced the yields in the government bond markets of the periphery countries started a steep descent. The beauty of that announcement was that the ECB did not have to buy one euro in the government bond markets.

The issue arises of how credible the OMT-program is for future use. The credibility problem arises from the fact that when using the OMT program the ECB will have to decide whether the crisis it is facing is due to a liquidity or a solvency problem. If it determines it is a liquidity problem it should step in; if it decides it is a solvency problem it should not. In the latter case the other governments should decide whether or not to support the troubled government.

This creates political problems that the ECB cannot take on. It is generally very difficult to determine in real time whether the problem is due to lack of liquidity or to insolvency. The uncertainty surrounding liquidity versus solvency problems makes it difficult for the ECB to step in without creating political controversy. In the Greek crisis of 2015 the ECB decided that the Greek problem was one of insolvency of the Greek government and therefore it refused to support the Greek government bond market, precipitating the crisis and leading to intense political conflicts in the Eurozone.

All this will lead to doubts about the willingness of the ECB to provide liquidity to future governments in times of crisis. As a result, the credibility of OMT is limited, which means that it is not a foolproof insurance mechanism that will stabilize the markets in future crises.

This problem does not exist in standalone countries. The commitment of the central bank to support the sovereign of a standalone country in times of crises is unconditional mainly because in times of crisis the sovereign prevails over bureaucrats at the central bank. This may come at a price though, because it also implies that the credibility of the central banks' commitment to price stability is less than 100%. Paradoxically, one may argue that the commitment of the ECB towards price stability is stronger than in standalone countries precisely because the commitment of the ECB towards the support of the 19 different national governments is weak.

The only way to solve the lack of credibility of the ECB as lender of last resort in the government bond market is by creating a budgetary union that includes the

consolidation of a significant part of the national debts into one Eurozone debt. This could be achieved by the issuance of Eurobonds that are backed by a joint liability of the issuing governments (see Delpla and von Weizsäcker (2010), De Grauwe and Moesen (2010)). Such a consolidation mimics the relation between the central bank and the government that exists in standalone countries. It makes the credibility of liquidity support of the sovereign watertight and eliminates the danger of destabilizing capital flows within the union. Clearly such a consolidation can only occur if it is embedded in a political union, characterized by a central government that has the democratic power to tax and to spend. These are very intrusive, if not revolutionary transformations of the Eurozone, for which there is little appetite today in official circles. These have now taken for granted that a further significant budgetary union together with a political union in which the budgetary union must be embedded is out of reach for the foreseeable future (which undoubtedly is true). As a result, they tend to embrace technical solutions that can solve the problem while avoiding the need to create a budgetary and political union.

One such technical solution is to create a “safe asset”. This was proposed recently by the ESRB (2018) based on research done by Brunnermeier, et al. (2016). It was also one of the proposals made by the French-German group of economists (see Benassy-Quéré, A., et al. (2018); see also Pisani-Ferry (2013)).

The essence of these proposals consists in the issuance of a new asset that would be backed by a portfolio of national government bonds. Each government, however, would remain fully responsible for the bonds it has issued. Thus there would be no joint liability as is the case with Eurobonds. This new “safe asset” would consist of two tranches, a senior and a junior tranche. The senior tranche (70% of the total issue) would be safe; the junior tranche (the remaining 30%) would carry a risk of sovereign default. Thus, if one or more governments default on their bonds the holders of the junior tranche would take the hit. The holders of the senior tranche would be safeguarded as long as the total of the defaults does not exceed more than 30% of the nationally issued bonds.

How likely is it that these SBBSs will help to stabilize the Eurozone? Note that in the way we formulate the question we do not dispute that in normal times the creation of a safe asset may not increase the efficiency of the financial system in the Eurozone. It probably will do so by supplying a new type of asset that can provide for a better diversification of normal risks. The issue is whether the safe asset will be an instrument for dealing with systemic risks in times of crisis? Our answer is negative for the following reasons.

First, the creation of a safe asset does not eliminate the national government bond markets. This is recognized by the proponents of a safe asset (see ESRB (2018) and Brunnermeier, et al. (2016)). In fact these proponents have made the continuing existence of national sovereign bond markets a key component of their proposal. According to the ESRB “the SBBS issuance requires price formation in sovereign bond markets to continue to be efficient” (p. 33). The markets for sovereign bonds must remain large enough so as to maintain their liquidity. That is also why the ESRB proposes to limit the total SBBS issuance to at most 33% of the total outstanding stock of sovereign bonds.

This constraint on the issue of SSBS implies that national sovereign bond markets will be “alive and kicking”. As a result, the major problem that we identified earlier, i.e. the potential for destabilizing capital flows across the borders of the monetary union will still be present. However, since the markets of sovereign bonds will have shrunk the yields are likely to be more volatile during crisis periods.

Second, we observe that during crises, the correlation pattern of yields changes dramatically. During normal times all yields are highly positively correlated. During crisis times, as investors are looking for safe havens, the yields in the safe assets tend to decline sharply and become negatively correlated with the high risk yields. This pattern was very pronounced during the sovereign debt crisis of 2010-12. In their simulations of the risks involved in SBBSs Brunnermeier, et al. (2016) do take into account the fact that risks can be correlated. However, this correlation pattern is fixed, while during crisis periods correlation patterns change dramatically. We show this feature in Table 1 in appendix. We find that during the sovereign debt crisis of 2010-12, the government bond yields of the periphery countries were negatively correlated with the yields of the core (safe) countries like (Germany, Finland, France, Netherlands).

The implication is that during crises it is very unlikely that the senior tranche in the SBBS can maintain its status of safe asset. It will consist of bonds investors dump and “safe-haven” bonds. The senior tranche will continue to depend on the cash flow generated by bonds that panicking investors deem to be extremely risky. The perception that this senior tranche is equally safe as the safe-haven sovereign bonds (e.g. German bonds) is very unlikely when markets are in panic mode. As a result, it is also likely that investors will flee the senior tranches of the SBBS to invest in the “real thing”, i.e. super safe sovereign national bonds.

6.3 A banking union

In order to cut the doom loop between the sovereign and the domestic banking sector it is now generally accepted that it is necessary to create a banking union in the Eurozone. This will make it possible to resolve banking crises at the union level thereby insulating the sovereign from the consequences of banking crises and also to eliminate the reverse link between sovereign and banking sector.

Significant progress has been made in creating a banking union. Such a banking union consists of three components: common supervision, common resolution, and common deposit insurance. The first component is a reality; the second one is partially realized; the third one is completely absent. The lack of progress in the second and third leg of the banking union is essentially due to the same factor as the lack of progress towards a budgetary union. These require a willingness to allow taxpayers of one country to take on commitments to help other countries. At this moment of history this willingness does not seem to be present.

We can conclude that we are still far removed from a full banking union. The result of all this is that the Eurozone is still unprepared to face a major banking crisis.

We started this paper by observing that the countries that were hit by a sovereign debt crisis during 2010-12 were also the countries that during the 1990s experienced foreign exchange crises. This led us to ask the question whether these countries (that we call periphery countries) carry the burden of some “original sin” that leads them into financial turbulences whether they are in the monetary union or not. We analyzed the potential nature of this “original sin”. We argued, however, that the case for the existence of an “original sin”, and thus some deterministic force that condemns countries in the periphery to stay in the periphery indefinitely, is weak. We concluded that countries that are in the periphery today can become part of the core and vice versa. There is nothing deterministic about the question of which countries can be hit by crises.

We analyzed how the Eurozone problems should be dealt with. We argued that the long run success of the Eurozone depends on a continuing process of political unification. Political unification is needed because the Eurozone has dramatically weakened the power and legitimacy of nation states without creating a nation at the European level. This is particularly true in the field of stabilization

Real stabilization of the Eurozone goes through two mechanisms. The first one is the willingness of the ECB to provide liquidity in the sovereign bond markets of the Eurozone during times of crisis. The ECB has set up its OMT-program to do this. However, OMT is far from credible and is loaded with austerity conditions, which will be counterproductive when used during recessions (which is when crises generally occur). That is why a second mechanism is necessary. This consists in creating Eurobonds that are based on joint liability of the participating national governments. Without such joint liability it will not be possible to create a common sovereign bond market. The creation of such a common bond market is the *conditio sine qua non* for long-term stability of the Eurozone.

The political willingness to go in this direction, however, is non-existent today. There is no willingness to provide a common insurance mechanism that would put taxpayers in one country at risk of having to transfer money to other countries. Under those conditions the sovereign bond markets in the Eurozone will continue to be prone to instability.

Recently, proposals were made to use financial engineering as a tool to stabilize the Eurozone. Although some of these proposals, e.g. the “safe asset” proposal can be useful in contributing to more market efficiency in normal times, we argued that they will not contribute significantly in making the Eurozone more stable. The danger of these proposals is that they allow policymakers to believe that the objective of stability can be achieved by some technical wizardry without having to pay the price of a further transfer of sovereignty.

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Appendix

Table 1

Correlation of yields before crisis (2000M1-2009M12)

	Germany	Finland	Netherlands	Austria	France	Belgium	Italy	Spain	Ireland	Portugal	Greece
Germany	1.00										
Finland	0.97	1.00									
Netherlands	0.97	1.00	1.00								
Austria	0.94	0.99	0.99	1.00							
France	0.98	1.00	1.00	0.99	1.00						
Belgium	0.95	1.00	0.99	1.00	0.99	1.00					
Italy	0.89	0.97	0.96	0.99	0.96	0.98	1.00				
Spain	0.94	0.99	0.99	1.00	0.98	1.00	0.99	1.00			
Ireland	0.61	0.78	0.76	0.83	0.74	0.81	0.88	0.83	1.00		
Portugal	0.90	0.98	0.97	0.99	0.96	0.99	0.99	0.99	0.87	1.00	
Greece	0.68	0.83	0.82	0.87	0.80	0.86	0.92	0.88	0.96	0.91	1.00

Sources: European Central Bank and authors' own calculation.
Note: The yields are yields on 10-year government bonds.

Table 2

Correlation of yields during crisis (2010M1-2012M09)

	Germany	Finland	Netherlands	Austria	France	Belgium	Italy	Spain	Ireland	Portugal	Greece
Germany	1.00										
Finland	0.98	1.00									
Netherlands	0.99	0.99	1.00								
Austria	0.89	0.93	0.91	1.00							
France	0.83	0.89	0.87	0.98	1.00						
Belgium	0.45	0.58	0.54	0.74	0.80	1.00					
Italy	-0.66	-0.57	-0.58	-0.34	-0.21	0.28	1.00				
Spain	-0.62	-0.60	-0.55	-0.48	-0.34	0.02	0.81	1.00			
Ireland	0.16	0.24	0.24	0.28	0.38	0.68	0.38	0.44	1.00		
Portugal	-0.62	-0.52	-0.54	-0.32	-0.19	0.29	0.88	0.73	0.54	1.00	
Greece	-0.82	-0.79	-0.78	-0.62	-0.50	-0.13	0.81	0.81	0.23	0.85	1.00

Sources: European Central Bank and authors' own calculation.
Note: The yields are yields on 10-year government bonds.

Table 3

Correlation of yields after crisis (2012M10-2017M12)

	Germany	Finland	Netherlands	Austria	France	Belgium	Italy	Spain	Ireland	Portugal	Greece
Germany	1.00										
Finland	1.00	1.00									
Netherlands	1.00	1.00	1.00								
Austria	1.00	0.99	1.00	1.00							
France	0.99	0.99	0.99	0.99	1.00						
Belgium	0.99	0.99	0.99	0.99	0.99	1.00					
Italy	0.92	0.91	0.92	0.93	0.95	0.95	1.00				
Spain	0.90	0.90	0.90	0.92	0.92	0.94	0.97	1.00			
Ireland	0.93	0.93	0.93	0.95	0.95	0.96	0.97	0.99	1.00		
Portugal	0.78	0.78	0.79	0.82	0.83	0.85	0.93	0.93	0.92	1.00	
Greece	0.31	0.31	0.31	0.35	0.34	0.38	0.45	0.58	0.55	0.57	1.00

Sources: European Central Bank and authors' own calculation.
Note: The yields are yields on 10-year government bonds.

The future of globalisation and challenges for advanced economies

By Richard Baldwin¹

1 Introduction

We think of globalisation as being driven by the gradual lowering of natural and man-made trade costs, but that is a mistake. Globalisation in recent centuries has been driven by two processes, not one.

Globalisation advanced in the late nineteenth century when steam power slashed the costs of moving goods internationally. Globalisation then made an advance in the late twentieth century when ICT radically lowered the cost of moving ideas internationally.

The first advance, what we should perhaps call "old-paradigm" globalisation, helped create industrial agglomeration in today's advanced economies (AEs), taking the G7 as a proxy for all AEs. The G7 industrialisation drove G7 growth take-offs. Although modest by today's standards, the fact that modern growth started sooner and proceeded faster than it did in other nations meant that the G7's share of world GDP soared. In 1820 it was one-fifth, but by 1988 that had risen to two-thirds. The G7's share of world trade also rose steadily. This has been dubbed the "Great Divergence" by historians.

More recently, the second leap – let us call it new-paradigm globalisation – has suddenly reversed this growth-rate ranking. Emerging Markets (Ems) are now growing faster than the AEs – and have been since 1990 or so. The newly reversed growth gap has, in just a few decades, shifted GDP shares back towards their pre-1820 levels. The G7's shares of world GDP and trade have plummeted to 50% and 32% respectively.

This evolution, which I first wrote about in Baldwin (2006), is a story of three "unbundlings". We have already seen two of them. The third one, which will be the future of globalisation, is beginning to happen now.

2 The first unbundling

Since the dawn of human civilisation, the high cost of moving goods, ideas and people forced the geographic "bundling" of production and consumption. Every village made almost everything it consumed. Old-paradigm globalisation – riding on the back of mechanical power rather than animal power – saw a massive lowering of the costs of

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moving goods across borders. The fall in trade costs between 1820 and 1914, for example, was three times larger than the fall of trade costs that has happened after 1945. This had revolutionary effects on the world's economic geography. For settlements everywhere it became feasible to "unbundle" production and consumption of goods. People could afford to buy goods made far away. And once it was feasible, the vast differences in efficiency between places made it profitable too. Trade boomed. This is what David Ricardo was writing about in 1817 when he advanced his famous concept known by the awkward phrase: comparative advantage.

The intellectual framework we still use today when thinking about globalisation (which is mainly trade theory) was codified at this time. Using our naming scheme, this is "old-paradigm" thinking. It offered two important insights at the time:

1. **A nation's economy was mainly connected to the world through goods markets.** Further globalisation should therefore be seen as intensification of goods markets competition. This competition had different impacts in different sectors. A nation's best sectors – the 'sunrise' sectors – gained, because freer competition allowed them to win markets abroad. The nation's 'sunset' sectors lost.
2. **Sunrise and sunset sectors were associated with distinct skill groups.** In rich nations, sunrise sectors tended to hire skilled workers and employ high technology much more than the sunset sectors. Globalisation's winners were associated with skilled workers and high technology, the losers with unskilled workers and low technology.

Wise government realised that globalisation inevitably created domestic winners and losers, but that the winners won more than the losers lost. And so they adopted complementary domestic policies to share the gains and pains. Policymakers designed education, technology and industrial policies to help sunrise sectors rise faster, and the sunset sectors set more gently. They put in place social policy, subsidies, and employment laws to lessen the pain that the workers in the dis-favoured skill groups in sunset sectors were suffering. The entire European social market economy model has been built on this concept of encouraging open markets, and then sharing the gains and pains they bring.

Of course, this enlightened governance was not the first reaction to the pains and gains. Most governments in the 19th century sought to delay and deny the need for complementary domestic policies. But after the push back the western world suffered in the 1920s and 1930s – including the spread of fascism, communism, the Great Depression, and two world wars – G7 governments embraced social policy aimed at sharing the gains and pains. FDR's "New Deal" was in the vanguard of this accommodation, but all advanced economies soon followed by setting up 'social market economies'. As part of this effort to heighten the gains and lessen the pains of globalisation, post-war policymakers controlled the pace of the first unbundling by lowering tariffs gradually. The fact that transportation technology improved only gradually smoothed the economic sectoral transitions that opening to world trade demanded. This gave workers and firms time to shift resources out of the country's sunset sectors and into sunrise sectors.

And so, from the steam age onwards, old-paradigm thinking has taught governments to think of globalisation as a slow, predictable process whose economic effects are on particular sectors and well-defined skill groups. This all changed in the late 1980s and early 1990s. The ICT revolution created a second unbundling. To understand what the second unbundling was undoing, we have to look at what might be called the spatial globalisation paradox – industry clustered locally, even as it dispersed internationally. In some ways, it seemed that distance was mattering more even as trade got freer.

3 The second unbundling

During the first unbundling, production dispersed internationally and, paradoxically clustered nationally. Factories sprung up next to each other, helping to create industrial districts. Or to put it differently, while England as a whole industrialised massively most of rural England de-industrialised. Almost all of the new industry clustered in cities like Manchester as cottage industry shifted to modern factors. Why did this happen?

We can explain this paradox very simply, once we realise that steam power did not lower the cost of communications as much as it lowered the cost of moving goods. More precisely, globalisation – driven by cheap transportation – favoured large-scale production. This sort of manufacturing tended to be extremely complex, and production gathered in factories and factories gather in industrial districts and particular cities to keep down the cost of coordinating the new complexity. It was the high cost of moving ideas that caused the clustering of industry, not the cost of transportation.

In other words, relaxing the transportation constraint meant the binding constraint was the coordination constraint. Coordinating a complex industrial process demanded continuous flows of goods, ideas and people. Factories were the way to address the coordination constraint. Factories, in short, replaced dispersed cottage industry to save communication costs, not shipping costs.

This is where the second unbundling comes in. Radical reductions in the cost of moving ideas, relaxed the need to cluster all production stages in the same place. The factory, in other words, are what was unbundled in the second unbundling.

From the mid-1980s, the ICT revolution made it economically feasible to separate those manufacturing stages. Once it was feasible, vast international wage differences that had built up during the Great Divergence made it profitable. Firms responded by offshoring some of those stages.

In the second unbundling, globalisation happened differently

This is new-paradigm globalisation. It impacts an economy with a finer degree of resolution. This time, stages of a production process or even occupations are subject to intense competition, rather than entire sectors. This impact is more sudden.

Policymakers have found that, unlike tariffs, the adoption of ICT by firms cannot be easily controlled or slowed, even if they wanted to do so.

The impact of ICT has also been hard to predict reliably. While most traded goods were affected more or less proportionally by lower trade costs, and so the impact of lower tariffs could be forecast with some degree of confidence, it is far more difficult to decide which stages are becoming footloose as ICT transforms a production process.

So new-paradigm globalisation is more individual, more sudden and more unpredictable.

The second unbundling was about technology, not trade

The new globalisation's different impact – the Great Convergence rather than the Great Divergence – is because the second unbundling is driven by know-how. It is a trap to even think about the second unbundling as being about trade.

Now, firms from high-technology nations can recombine their firm-specific managerial, technical and marketing know-how with developing-nation labour. Efficiency gains have occurred when off-shored stages and the rest of the production network have been able to interoperate seamlessly, and evolve in tandem.

At firm level, decision-makers have leveraged the value of their firm-specific know-how by combining it with low wages, in developing nations. Trade and investment have been merely symptoms of this phenomenon, not the drivers of it.

To put it differently, the second unbundling de-nationalised the sources of comparative. It allowed G7 firms to take their firm's knowledge – knowledge that used to have to be exploited domestically – and apply it internationally. In a nutshell, the second unbundling broke the monopoly that G7 workers had on the use of G7 technology.

4 The third unbundling

The central idea of this broader view of globalisation is that it requires we distinguish three types of separation costs. There are trade costs, communication costs, and face-to-face costs. Each tends to separate national economies. Drops in these costs tend to foster economic integration, namely globalisation. Drops in the first two explain historical globalisation:

1. In the nineteenth century the cost of moving goods plummeted.
2. In the late twentieth century, the cost of moving ideas plummeted.

The future of globalisation, I believe, will not be a continuation of these trends.

3. In the early twenty-first century, globalisation is likely to be driven by radical reductions in face-to-face costs.

This is not inevitable but if these cost reductions occur, they are likely to stem from a revolution in "virtual presence". Advances in telecommunications will create "telepresence", which acts as a close substitute for in-person meetings, which offers the potential to globalise decision-making. And "telerobotics" – technology that allows faraway people to act locally via locally-based robots – will globalise the activities that flow from that.

Global wage arbitrage

The second unbundling was driven by cost differences in workers between high-wage and low-wage nations. Offshoring production became a way to use the services of low-wage labour in other nations. A German firm with frontier technology could combine that technology with Chinese labour. It could potentially do this by moving chunks of its production to China, or by bringing Chinese people into German factories. If it offshored stages of production, low-cost Chinese labour services would be embodied in goods that would then be exported back to Germany, sold in China, or exported to third markets. But if it could bring the labour of Chinese people to Germany for the same wage, those labour services would be embodied in German goods.

At a high level of abstraction, both options involve the process of arbitraging international wage differences.

Telerobotics, telepresence, and "virtual immigration"

But, to now, arbitrage via offshoring has not been possible for many activities because some things are non-traded. Gardening services, for example. The only way to use Mexican labour services to tend to a US garden is to employ Mexicans in the US gardens.

Telerobotics could change all this for manual workers. It would allow workers based in developing nations to provide labour services inside developed nations without actually being there. Call it "virtual immigration", or telecommuting for manual workers.

Telepresence could do the same for knowledge workers living in developing nations. If telepresence meeting facilities were cheap and portable enough, and holographic telepresence was widespread, the need for face-to-face meetings would be greatly reduced, if not eliminated. This would make the global provision of brain power more efficient.

Two consequences

Relaxation of the face-to-face constraint is likely to produce two large changes.

1. Production unbundling has so far changed radically a handful of developing nations. These effects are likely to spread.

The miracle of global value chain industrialisation has, so far, occurred only in a handful of developing nations – most of whom are geographically close to Japan, Germany and the US. The north-south imbalance in knowledge-per-worker is still large. As wages rise in the nations that have so far benefitted from globalisation the most – above all China – firms with advanced knowhow may increasingly find supplies of low-cost labour in Africa or South America. Chinese firms may themselves lead this new offshoring.

2. Cheap, reliable and ubiquitous virtual presence technology and telerobotics are likely to make it easier to bring unbundling to the service sector.

The face-to-face constraint is especially binding in the service sector. We can see this in the physical layout of most service-producing firms. In sectors ranging from banking to engineering, service firms cluster workers in tight proximity – often on the same floor or even in the same open-space work area – to economise on face-to-face costs.

Given that G7 service-sector wages are often ten times as high as those of highly skilled and highly educated workers in developing nations, the scope for arbitrage is enormous.

This would be nothing more than an amplification of what is already happening. "Micro-outsourcing" is the ability to use ecommerce to hire individuals to perform a small, standalone task as part of a larger project. Virtual presence will make the fractionalisation and offshoring much easier to coordinate.

5 Challenges for advanced economies

The nature of globalisation has changed, and it does not seem to be working as it used to. Globalisation now involves northern know-how shifting to a handful of developing nations inside global value chains. This requires a reformulation of advanced economy policies such as those on competitiveness, industry, cities, and society.

- **Competitiveness policy.** In a world marked by fragmented, footloose production, policy should consider the "stickiness" of production factors that it promotes, as well as any spillovers that the private sector ignores.
- **Industrial policy.** This should focus less on industry and more on service-sector jobs related to industry.
- **Urban policy.** Since many of these jobs are, and will continue to be, in cities in the global north, governments should think about cities as twenty-first-century factories. Urban policy should be crafted with an eye on international competitiveness.
- **Social policy.** The rupture that globalisation causes between G7 labour and G7 knowledge owners should be redressed by social policy that focuses on workers, not jobs, and on helping sectors and workers adjust to globalisation rather than trying to resist the changes.

Future globalisation will be quite different and will again require a policy rethink. But the third unbundling may be much like the first one, because it does not involve the movement of knowhow across borders or factories across borders. Instead, it makes possible trade in things that were previously untraded. We can think of it as our allowing our offices to cross national borders.

The result will likely be a need for many advanced economy workers to change jobs, but that is nothing new. In a first transformation, workers had to move from farms to factories, and in the second, from factories to offices.

The first transformation did not go smoothly. It spanned two world wars, the Great Depression, and the rise of radically new economic systems – fascism and communism. The second transformation was difficult, but was mostly slow enough to allow adjustment without radical opposition (at least in the advanced economies that had put in place comprehensive policies to help the losers of the transition – that is, every advanced nation except the US). We will need a lot more of this type of assistance in the near future.

Future globalisation – the third unbundling – will cause problems for firms and many of their workers. Governments will need to make it easier for people to adjust.

Rapid change on this scale is difficult, but no intervention needs to be radically new. Structural change has been a constant since the industrial revolution. In the past, governments have tried their own policy mixes to help their citizens adjust and to maintain social cohesion. Some nations have been successful at this – those in northern Europe and Japan are good examples – but others have not.

Governments that want to avoid an explosive backlash must decide how to maintain political support for these changes, to find new ways to share the gains and pains. That means helping workers adjust to job displacement and foster job replacement. Who knows how fast the changes will come – the frenetic pace at which digital technology is advancing defies precise calculation – but governments should be ready to do something if it turns out to force changes faster than social cohesion can absorb them. They should be ready to slow down some changes if blunt, across-the-board policy measures.

Redistribution will undoubtedly be part of the solution, but financial compensation alone would not be sufficient. Jobs define people's lives, and often their membership in communities. The flexicurity policies in Denmark, which combine financial support with retraining, are a guide to what may be possible on a larger scale.

My guess is that similar types of interventions that were successful at navigating the upheaval experienced since 1973 (and the governments that implemented them) will succeed in avoiding extreme backlashes in the future.

6 Concluding remarks

The post-war opening of world trade transformed societies with good and bad effects, but the changes were spread over decades. Each change created new opportunities for some, and new competition for others. Each brought with it strong social and economic tensions since the new opportunities mostly rewarded a nation's most competitive workers and firms, and disadvantaged the least competitive. But societies and communities had time to adjust and there was little radical backlash. It is not guaranteed that history will repeat itself.

The radical transformation that was started by the industrial revolution, and the shift from feudalism to capitalism, destroyed the social fabric that had been based on reciprocity and ancient hierarchical relationships over centuries.

At that time, though, the push and push back both took decades. Industrial and societal revolutions started accelerating around 1820. In *The great transformation*, Karl Polanyi observed in 1944 that the commoditisation of labour and mass migration to urban and industrial areas eventually disturbed traditional values so much that people pushed back by embracing extreme right and left politics – but communism and fascism were not widely popular until the 1920s.

Future globalisation is moving much faster. It can happen with public approval if we can make sure it advances at a human pace. But to achieve this, governments in advanced economies might have to slow down the process. If no other tools are available, they could use existing employment protection legislation. That would be perhaps the fifth-best outcome, but to paraphrase one American politician, you don't tackle economic crises with the policies you wish you had. You use the policies you actually have.

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The future of central banking

By Benjamin M. Friedman¹

It is a great pleasure to join in saluting our colleague and dear friend Vítor on this distinguished occasion in his honor. Vítor has made an important contribution to the Bank during his eight years of service – a period that has tested not only the ECB but central banks more generally. Beginning in 2011 he placed a special emphasis on the linkages connecting financial stability and macroeconomic stability, and the consequent link between financial regulation and what we now call macro-prudential policy. In 2013 Vítor took the lead in addressing the need for banking union, including a single supervisory mechanism, to accompany Europe's monetary union, forthrightly acknowledging that monetary policy and banking policy cannot be separated. During this post-crisis period he has consistently directed his attention to a wide array of aspects of the financial market environment and their implications for the efficacy and success of monetary policy. And throughout, he has displayed the integrity and the courage that today is too frequently absent in our nations' public life. The ECB, and all Europeans, are greatly in his debt. So are all of us assembled here.

But ours is an endeavor in which the work is never done: as the great moralists have repeatedly taught us, we are not required to finish the task, and the kingdom is always but coming. Especially at this time of transition in the leadership of not just the ECB but several other major central banks too, it is valuable to look ahead to the challenges remaining. As the title of this conference in Vítor's honor reminds us – “The *Future* of Central Banking” – these challenges will be different from those of the past eight years. By now the financial crisis is well over, and our economies have mostly put their post-crisis downturns behind them. Economic growth has resumed, although, ominously, this is so in the aggregate but not yet for all too many of our fellow citizens. Free trade among nations is under challenge as not before within our lifetimes. And we cannot be confident that the extended period of price stability that stands as central banks' primary achievement of the past quarter-century will remain intact.

I believe that our central banks' most significant challenge over the next eight-year period will be to rethink the inflation targeting strategy that, in one form or another, now constitutes the central organizing principle of their monetary policymaking. The reasons are fourfold.

First, and almost trivially compared to the other three, there is the arbitrariness surrounding the current 2 percent target. In retrospect, the paucity of serious empirical research underlying the identification of the 2 percent norm, now quite some time back, is a professional embarrassment. More significantly, the experience since then is surely informative; if 2 percent actually were a seriously derived answer to some well specified research question ten years ago, it would not be today.

¹ William Joseph Maier Professor of Political Economy, Harvard University. Remarks presented at the European Central Bank Colloquium Honoring Vítor Constâncio, Frankfurt, Germany, May 17, 2018.

The familiar response to such concerns is that central banks must nonetheless leave the 2 percent target in place because to change it would unsettle and even confuse the public's expectations, and thereby undermine public confidence in the central bank's commitment to price stability however defined. This argument is breath-taking in its thinness. It is also insulting to the mental capacity of the public. Any central banker who offers it should immediately be asked why he or she then thinks it is a good use of bank resources to maintain a DSGE model – or, for that matter, any analytical construct based on so-called rational expectations.

Second, not because the public is obtuse in such matters but precisely because it is not, central banks are increasingly at risk of undermining their own credibility by continuing on, year after year, highlighting the importance of specific quantitative targets that they do not meet. In my country, for example, inflation has under-shot the Federal Reserve's 2 percent target for the past nine years in a row, with a cumulative shortfall of the price level of 5 percentage points. My personal view is that this low rate of inflation is not a problem – quite the contrary; but that is not the point.

This particular problem for central banks is all the greater because we live in an era in which our governments and their leaders routinely pronounce economic absurdities: Growth, even with no immigration, will average 4 percent. The tax cut will pay for itself. Mexico will pay for the wall. Net savings from leaving the EU will pay for improvements to the National Health Service. Three arrows will strike the bull's-eye and thereby restore economic prosperity. Most central bankers respond to such pronouncements with either winks or groans, depending on their political loyalties. But neither the winks nor the groans can prevent the tarnish rubbing off on their own credibility from their inevitable association with the political leaders who appoint them.

Third, observed shifts in the relationship between price inflation and real economic activity – crudely put, the flattening of the Phillips Curve, although the phenomenon is both broader and more subtle than that – seriously undermine the usefulness of the inflation targeting framework. We are all familiar with simple classroom models in which, by the magic of purely expectations-based mechanisms, a central bank's credible commitment to a specific inflation target is sufficient to determine its economy's actual inflation rate. The economies for which our central banks are responsible do not conform well to those models. Real economic activity – producing, buying and selling, hiring and firing – is integral to the price- and wage-setting process.

But the connection between real activity and the price process has weakened. There is no lack of potential explanations: globalization of the labor market, reduced unionization, increased concentration of industry, and others besides. Establishing the respective quantitative roles of these and other causes underlying today's flatter Phillips curve is a worthwhile object of empirical research. From the perspective of monetary policy, however, what matters is not so much why the Phillips curve has flattened, but that it has.

An important consequence, one which we have already experienced, is therefore the diminished ability of the central bank to deliver on whatever inflation target it announces. The issue is one of both magnitude and uncertainty. Especially with the efflorescence of macroeconomic research following the last decade's financial crisis –

research into such topics as credit market failures, the imperfections of business lending by banks, and implications of mortgage financing arrangements for consumer spending – we know much more than we used to about how what central banks do affects real economic activity. We know less than we once thought we did about how what they do affects wages and prices.

In parallel, a further consequence of today's flatter Phillips curve is therefore the reduced capacity of the inflation targeting framework itself to subsume whatever objectives the central bank maintains for aspects of real economic activity. For anyone who prefers that the central bank have no such objectives, this, of course, is not a problem. But the record of nearly all countries' monetary policies over the last decade makes clear that, in fact, central banks do have, and regularly act upon, objectives pertaining to output, or employment, or other aspects of real activity. We know, from the theoretical work of Tinbergen more than half a century ago, that in a well-structured economic system (for this purpose, one in which the Phillips Curve is not perfectly flat) any one variable subject to the influence of economic policy is, in principle, capable of representing the entire set of policy objectives. But as a practical matter, how well any such representation works is an empirical question. Part of what a flatter Phillips Curve means is that inflation, as one among the central bank's multiple policy objectives, is less suitable to stand in for the rest.

This empirically-based conclusion leads to yet a fourth reason central banks now need to rethink today's pervasive inflation targeting framework: The structure imposed on any decision-making process matters for the decisions reached. So does the vocabulary in which decisions are discussed. In recent times central banks have increasingly imposed on themselves the requirement to structure their monetary policy deliberations in terms of the relationship between actual, or forecast, inflation and the corresponding inflation target – even when what the decision is mostly about is something else. And then, when time comes for the important task of communicating to the public what decision they have reached, and on what grounds, they again feel the need to frame the explanation in terms of reaching a targeted rate of inflation.

More than two hundred fifty years ago, David Hume, lamenting the emptiness of British political debate during his era, observed that "The Tories have been so long obliged to talk in the republican stile that they seem to have made converts of themselves ... and to have embraced the sentiments, as well as language of their adversaries."² Whether intentionally or not, the architects of the inflation targeting strategy in the last generation did more than find a way to shape the public's expectations so as to erect a bulwark against a return to the rapid and chronically persistent inflation of the 1970s and 1980s against which they so valiantly struggled. By confining so much of central banks' discussion of monetary policy within a structure and a vocabulary centered on containing inflation, they straight-jacketed the thought process of the next generation's participants in the policymaking process.

² David Hume, "The Parties of Great Britain" (1752). *Essays: Moral, Political and Literary* (Indianapolis: Liberty Fund, 1987), p. 72.

Re-litigating whether that structure and vocabulary were right to adopt at the time is of little value other than the historical. What now matters is that the economic environment that central banks will face over the coming generation will be – it already is – different from that of fifty years ago, or even twenty years ago. The task awaiting the next generation of central bank leaders will be to put in place a decision-making structure that is right for the economic environment our economies will now be facing. I urge them to make it a high priority.

Completing the Odyssean journey of the European Monetary Union

By Vítor Constâncio¹

Ladies and gentlemen,

I would like to begin by thanking my Executive Board colleagues for organising once more a farewell conference for the departing ECB Vice-President. All great institutions maintain rituals of recognition that are predominantly directed to preserve a sense of community and collective work, as well as being opportunities to reflect on future endeavours. In this context, I am particularly grateful to all speakers in this colloquium: academics and economists that I respect and admire and with whom I have interacted on several occasions over my years as Vice-President of the ECB.

Having spent almost 34 years working in central banks and 18 years as a member of the ECB Governing Council, the imminent departure is a challenging milestone to master. Milan Kundera, the great French-Czech writer, has accurately described the only silver lining of ageing and ending a career, seeing it as an enhancement of personal freedom resulting from having, as he put it: “No more applauses to conquer, audiences to seduce, ambitions to fulfil.” While an insider in a deontological demanding institution, one can exert some influence and generate slight nudges of opinion which may have some impact on events. I have my own private list of such little nudges, but I am very much aware of the limited influence of a sole individual on the major forces that shape reality.

However, before the *exit* from his position, the insider pays a price for this role, in terms of having to restrain his *voice* and respect his *loyalty* towards the institution, to use the well-known Hirschman’s tropes.² No one has expressed better than Galbraith the risks of such a situation: “The curse of the public man is that he first accommodates his tongue and eventually his thoughts to his public position. Presently saying nothing but saying it nicely becomes a habit. On the outside one can at least have the pleasure of inflicting the truth.”³

I have refrained until today to express my personal views on the reforms needed to deepen and strengthen the EMU. Close to departure I feel that, following other colleagues, the time has come to talk about what is missing to complete the Odyssean journey of the European monetary union. In the ancient Greek epic, Odysseus face a long and arduous journey home, facing storms and mythical monsters along the way. We are not home yet, and just as Odysseus was not satisfied during his seven years

¹ Vice-President of the ECB (May 2010 – May 2018).

² Hirschman, A. O. (1970), “Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States”, Cambridge, MA: Harvard University Press.

³ Galbraith, J. K. (1977), “Age of uncertainty”, Houghton Mifflin Harcourt, in chapter on The Mandarin Revolution, page 203.

spent on Calypso's island, we should not be lulled into a false sense of security by the current economic upswing.

It is true that with all member countries growing and after the great adjustment in the periphery to correct its imbalances, the euro area is much better prepared to resist external shocks in the immediate future. Thinking, however, farther ahead it is common knowledge that Europe, and particularly the euro area, remains at a crossroads today. The EU Commission Vice-President Frans Timmermans wrote amid the refugee and migration pressures and the euro crisis of 2015: "It is the first time, in my conscious experience of European co-operation that I think the project could really fail".⁴ Since then the winds of populist nationalism have continued to advance... In the narrower perspective of the monetary union, a recent IMF discussion paper by Obstfeld et al, states that: "...without decisive progress to foster fiscal risk sharing, EMU will continue to face existential risks".⁵

Monetary Union design

Aside from a single currency and a fiscal brake, the initial EMU's architecture was minimalist: the governance of economic and financial policies firmly remained a national competence and there was no fiscal policy at the European level, no crisis management mechanisms of financial assistance to states and no European financial supervision.⁶ This narrow concept was the result of the web of national interests, opposing any centralisation of complementary policies plus the dominant economic thinking of the time that reflected a practical convergence of traditional central European ordo-liberalism with the anti-Keynesian views of new-classical economics. In spite of the efforts of many economists, the design did not even reflect the theory of optimal currency areas. Rather, it promoted the view of a monetary union as a viable device of "hard money" to create price stability, from which efficient and smooth functioning of the economy would result.

The dominant economic thinking at the time of its inception, beyond promoting a minimalist design, favoured an optimistic view of how smooth and successful it could work. With fiscal control and price stability assured, potential imbalances stemming from the real interest shock suffered by countries coming from higher inflation regimes would be countered by counter-cyclical fiscal policy, by financial markets' disciplining effect of good credit risk management and by the gradual restrictive impact of real exchange rate appreciation. On the other hand, increased growth and real convergence would result from the so-called "Rose effect"⁷ of trade explosion and

⁴ Timmermans, F. (2016), "Fraternité. Rétrisser nos liens" Éditions Philippe Rey, original published as "Broederschap, Uitgeverij", Podium Amsterdam © 2015.

⁵ Berger, H., G. Dell'Ariccia and M. Obstfeld (2018), "Revisiting the economic case for fiscal union in the euro area", IMF Departmental Paper No. 18/03.

⁶ Constâncio, V. (2012), "Completing and Repairing EMU", speech at the Hyman P. Minsky Conference on Financial Instability organised by the Levy Economics Institute and ECLA of Bard with support from the Ford Foundation, The German Marshall Fund of the United States, and Deutsche Bank AG, Berlin, 26 November 2012.

⁷ Rose, A. K. (1999), "One money, one market: estimating the effect of common currencies on trade", NBER Working Paper 7432.

from the neo-classical mechanism of real capital migration to less developed areas where, without currency risk, returns would be higher. Sufficiently disciplined fiscal policy would permit its “shock-absorption” role by allowing the automatic stabilisers to play out in full, during downturns.

Monetary union was indeed conceived under the aegis of noble goals and some naïve illusions. Many politicians in core countries thought that after providing a single currency and a fiscal brake, it would be up to individual member countries to adjust their behaviour without the need for any additional collective concern or burden, something assured by the no-bailout clause and the prohibition of monetary financing. Monetary union could almost be seen as a vast currency board device to extend the benefit of price stability to the whole euro area. The only necessary thing would be for member countries to adopt well-behaved fiscal policies and to carry out structural reforms in order to foster growth. Financial imbalances, originating from private sector misbehaviour and excessive indebtedness were totally ignored. In turn, politicians in weaker countries saw the drop of interest rates and the disappearance of difficulties of finding foreign currency to pay for external deficits as an easy way to ensure growth and convergence without the need for fiscal prudence, responsible wage behaviour, structural reforms and real economy adjustment.

In 2000, in my role as central bank governor, I alerted that a successful participation in the monetary union implied adjusting behaviour to new rules to permanently maintain a counter-cyclical fiscal policy and sensible wage development. I wrote then: “In the past five years, unit labour costs (ULC) in Portugal have always grown above rates in the remaining euro area countries. This trend cannot continue indefinitely. [...] Thus, the 3.71% increases in the wage settlements of government employees, which may turn out to be effective increases of 6%⁸ as in recent years, are a bad example, hardly reconcilable with the situation of public finances, and should not be followed by the remaining sectors of the economy.”

All the illusions nurtured by Governments were shattered by the crisis. Imbalances accumulated in the run-up to the crisis, with the assumed protective mechanisms failing. The Stability Pact was breached by France and Germany in 2003/2004 and the restrictive role of real exchange rates appreciation was far too slow to operate. Financial markets showed yet again how badly they dealt with sovereign debt, almost equalising the yield of all member states bonds. At the same time, huge capital inflows inundated the weaker countries and the exposure of banks of core countries quintupled between 1999 and 2007.⁹

As governor of a central bank with banking supervision, in the context of free capital movements, I had no instruments to contain these inflows since the banks complied with their prudential ratios. The only change I could introduce related to liquidity management rules, raising the coverage ratio of interbank foreign funding by highly liquid assets from 86% in 2000 to 132% four years later. Portugal avoided a housing

⁸ As a result of wage drift.

⁹ See Constâncio, V. (2013), “The European crisis and the role of the financial system”, speech at the Bank of Greece Conference on “The crisis and the euro area”, Athens 23 May; later used for an article in the *Journal of Macroeconomics*, Vol 39 (204): 250-259.

price bubble, but not the incipient overheating expressed by a real exchange rate appreciation and a growing external deficit.

Contrary to the main narrative, popular in core European countries, the driver of these imbalances was not fiscal, with the exception of Greece. In 2007, the public debt to GDP ratios of Portugal, Spain and Ireland were respectively: 65%, 36% and 25%, well below the euro area average. In Italy, although still at 103%, public debt had fallen 10 percentage points since 1999. What had exploded since 1999 was the private debt in all these countries, confirming the general finding of Jordá, Schularick and Taylor (2016) on the analysis of financial crises in advanced economies from 1870 to 2008. The authors conclude that “private credit booms, not public borrowing or the level of public data, tend to be the main precursors of financial instability in industrial countries”.¹⁰ To offset or significantly mitigate the effects of the private debt expansion, budget surplus would have to have been unfeasibly high, as I showed in 2004.¹¹

The bitter discussion about how to interpret the crisis still lingers among member states and contributes to mistrust. For some, the design of monetary union was perfect and the blame for the crisis lies with peripheral countries and their unsound fiscal policies and excessive sovereign debt. For others, it is mainly a story of insufficient stabilization mechanisms and a traditional balance of payments crisis in a “fully fixed” exchange rate regime, with uncontrollable external capital inflows and a banking crisis.¹²

The crisis confirmed that the control of money and inflation is not enough to regulate the macroeconomy and that finance and debt are at the centre of our economies; private sector defaults and debt do not cancel each other out as in pure ‘Arrow-Debreu’ contracts. In a monetary union with the consequent financial integration, there are features like centralised supervision, deposit insurance and resolution of banks, with a fiscal backstop that are necessary for the whole framework to effectively function.¹³

Additionally, the crisis also made clear the design of monetary union had three crucial shortcomings:

First, the absence of any mechanism to respond to acute liquidity squeezes and “sudden stops” in the sovereign bond market, linked with the demotion of national public debts to debt with default risk. Panicking in markets, fragmentation and contagion without change in fundamentals, threatened the collapse of the whole

¹⁰ See Jordá, O., M. Schularick and A. Taylor (2016), “Sovereigns versus banks: credit, crises and consequences”, *Journal of the European Economic Association*, 14 (1):45-79; Schularick, M. and A. Taylor (2012), “Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870—2008”, *American Economic Review*, 102(2): 1029-1061.

¹¹ Constâncio, V. (2004) “European monetary integration and the Portuguese case”, in the ECB book “The new EU Member States: convergence and stability”.

¹² For more details see Constâncio, V. (2013), “The European crisis and the role of the financial system” *ibid.*

¹³ See Obstfeld, M. (2013), “Finance at the center stage: some lessons from the euro crisis”, EU Commission Economic Papers n. 493.

project. No one had thought about the possibility of capital flows “sudden stops” within the European monetary union.

Second, the framework did not include a macro stabilisation function to deal with asymmetric and symmetric significant recessionary shocks that may exacerbate fragmentation and create redenomination risk, as it happened in the double dip of 2012-2013. It is well documented that the second recession of 2012-13 in the euro area was the result of the simultaneous fiscal consolidation by member states. A working paper published by the Commission has shown that fiscal consolidation led to cumulative deviations from the baseline evolution in 2011-2013 between 8% in Germany to 18% in Greece.¹⁴ Another academic paper using different models finds a loss deviation from baseline between 14% to 20% for the euro area GDP during the same period.¹⁵ The absence of a coordinated fiscal policy from an euro area wide perspective has been a core problem of monetary union.

Third, economic and financial integration was not accompanied by any sort of European level supervision of the financial system, particularly of banks. The huge capital inflows into the European periphery, without due consideration to concentration and proper credit risk management, were not countered by prudential supervision that was fragmented across countries.

Under pressure of events, some answers were found to these three types of problems, from the creation of the European Stability Mechanism (ESM) and the Banking Union, a project still not finished. These responses illustrate that a monetary union can never be just a matter of demanding and assuming that individual member countries behave appropriately. The diversity of shocks, the level of financial integration and interdependence requires collective mechanisms for discipline and risk sharing. The unavoidable political economy debate stems from this, as stronger countries are tempted to deny that overall stability demands some risk sharing and underline instead mechanisms of risk reduction, whereas vulnerable countries tend to resist acceptance of severe risk reduction measures if risk sharing is not sufficiently present.

No surprise then that the discussion on continuing the repair of monetary union shortcomings has clustered around two approaches: one more minimalist and concentrated on risk reduction in weaker countries and the other more comprehensive, aiming at including also elements of risk sharing with a certain dose of fiscal union. In this last category, one could include the Five Presidents' Report,

¹⁴ See Veld, J. (2013), “Fiscal consolidations and spillovers in the Euro area periphery and core”, EU Commission European Economy Paper, Economic Papers 506, October 2013, Table 5, pages 10 and 11.

¹⁵ Rannenberg, A., C. Shoder and Strasky, J. (2015), “The macroeconomic effects of the European Monetary Union’s fiscal consolidation from 2011 to 2013: a quantitative assessment”, IMK Working Paper 156. See also House, C. L., Proebsting C. and L. L. Tesar (2017) “Austerity in the aftermath of the great recession” NBER Working Paper 23147, that estimates a DSGE model for 29 countries and finds cases in Europe where the debt ratio increased after the fiscal restrictive policy.

several documents by the European Commission and the IMF.¹⁶ The attempt by 14 French and German economists¹⁷ to put forward a well-intentioned attempt of a compromise between the two views is much too tilted towards risk reduction to be acceptable as a possible solution.

The minimalist approach has several variants but in general it denies the need for a macro stabilisation function, discards a reasonable way of dealing with government debt liquidity crisis and rejects an early creation of a European Deposit Insurance Scheme (EDIS), offering instead a long-term promise of a contingent implementation. On the other hand, it insists on strong instruments to force diversification of banks' holdings of domestic sovereign debt and to facilitate a sovereign debt restructuring mechanism (SDRM). When combined, these elements would create immediate instability in sovereign bond markets and induce self-fulfilling crisis.

Another specific variant of this approach, also including an SDRM, proposes the abolition of the Stability Pact and the renationalisation of fiscal policy.¹⁸ This would be combined with a full implementation of banking union with all its features, from EDIS to a stronger bail-in resolution regime. The underlying idea is that stabilising the banking sector without public support would be enough to create a workable monetary union with a self-equilibrating private sector. It seems unlikely to me that without an European safe asset, this could constitute a viable solution in view of the inextricable interdependences among sovereigns, the macroeconomy and finance in a monetary union. These would be compounded by the spillovers and contagion stemming from any sovereign debt incident in one member country.

I will address the problems with the minimalist view when describing my own views on what is a comprehensive approach to deepening and completing monetary union. I will not consider questions of political economy feasibility but my remarks reflect my experience of 18 years as member of the ECB's Governing Council.

In unfolding my views, thinking about the three shortcomings I highlighted before, I will focus on the following six points that I consider the more relevant ones to ensure a stable and effective monetary union: the settled solution to liquidity crisis in sovereign bond markets without an SDRM; the completion of the banking union; the creation of an European safe asset; the serious launch of a Capital Markets Union; the creation of a central macro stabilisation function; and finally, the revision of the Stability Pact.

¹⁶ European Commission (2015), "Completing Europe's economic and monetary union", a Report by Jean-Claude Juncker in close collaboration with Donald Tusk, Jeroen Dijsselbloem, Mario Draghi and Martin Schulz (the Five Presidents' Report); European Commission (2017a), "The Deepening of the Economic and Monetary Union" Reflection Paper, Brussels; European Commission (2017b), "Communication on further steps toward completing the EMU", December; IMF (2013), "Toward a fiscal union for the euro area", Staff Discussion Note 13/09; Berger, H., G. Dell'Ariccia and M. Obstfeld (2018), "Revisiting the economic case for fiscal union in the euro area", IMF Departmental Paper No.18/03; Arnold, N., B. Barkbu, E. Ture, H. Wang and J. Yao (2018), "A central fiscal stabilization capacity for the euro area", IMF Staff Discussion Note 18/03.

¹⁷ Bénassy-Quéré et al. (2018), "Reconciling risk sharing with market discipline : a constructive approach to euro area reform", CEPR Policy Insight 91.

¹⁸ Eichengreen, B. (2017), "The Euro's narrow path", Project Syndicate, September.

Sovereign debt in a monetary union

In relation to issues with sovereign debt in a monetary union, Charles Goodhart had already warned us back in 1998 in his classic paper on two concepts of money and optimal currency areas¹⁹: “Whenever states (as in the US or Australia), provinces (as in Canada), cantons, Länder, etc. have joined together in a larger federal unity, both the main political, the main fiscal and the monetary powers and competencies have similarly emigrated to the federal level. The Euro Area will not be like that. In particular, the participating nation states [...]; in the monetary field, their status will have changed to a *subsidiary* level, in the sense that they can no longer [...] call upon the monetary authority to create money to finance their domestic national debt. There is to be an unprecedented divorce between the main monetary and fiscal authorities”.

The far reaching consequences of this were not properly considered at the time. In 2012, talking about the gaps in the European monetary union, Christoffer Sims wrote in the same vein: “The combination of a treasury that issues fiat-currency debt and a central bank that can conduct open market operations provides a uniquely powerful lender of last resort. The euro as originally structured seemed to require the elimination of national-level lender of last resort functions for central banks, without creating as strong a replacement at the European level”.²⁰ He also warned that a narrow interpretation of the framework “would return Europe to something akin to the gold standard, with no lender of last resort, no inflation cushion against extreme shocks, and an implicit euro area bankruptcy court exacting sacrifices from delinquent debtors. It is not clear that the member nations thought this was what they were signing up for”.

In relation to this point, it is important to underline that the fragility of national sovereign debt is not automatically solved by a country having its own currency and a central bank. Besides this condition, the country must be sizable and with a strong currency so that it can issue all its debt in its own national currency considered as a safe and stable asset. Few countries are eligible to fulfil these features and vulnerable countries with public finance issues of high debt would certainly not satisfy the criteria.

Already in 2005, the ECB seemed to confirm a strict view on national public debt, when it changed its policy of accepting all such debt as collateral in regular monetary operations, by introducing a minimum rating by rating agencies, below which sovereign bonds would be no longer acceptable. It would have been preferable to exert its own assessment of credit risk and use a system of differentiated haircuts.²¹ With the crisis, the threshold had to be lowered and then waived in the case of official adjustment programmes, showing the unavoidable fragility of the initial ruling.

¹⁹ Goodhart, C. (1998), “The two concepts of money: implications for the analysis of optimal currency areas” *European Journal of Political Economy* 14 (3): 407-432.

²⁰ Sims, C. (2012), “Gaps in the institutional structure of the euro area”, in *Banque de France Financial Stability Review*, No. 16, April 2012, pages 217 -223.

²¹ Orphanides, A. (2017) “ECB monetary policy and euro area governance: Collateral eligibility criteria for sovereign debt”, MIT Sloan School Working Paper 5258-17; Orphanides, A. (2018) “Monetary policy and fiscal discipline: How the ECB planted the seeds of the euro area crisis” *VoxEU*, March.

Later, Paul de Grauwe (2011a, 2001b, 2011c) and Willem Buiter (2012)²² talked about a fragile euro area also called for the creation of a lender of last resort that could deal with sudden liquidity crisis in the markets of national sovereign bonds. The issue stems from the fact that the demotion of national public debt to debt with default risk opens the door, as in any other asset market, to episodes of acute liquidity stress with investors panicking or speculating, leading prices and yields to levels not justified by changes in fundamentals. Without a response, such events create contagion in a monetary union and self-fulfilling crisis with redenomination risks that may put into question the whole monetary union. These market reactions emerge also in several models of sovereign debt with default risk²³ in particular those that allow multiple equilibria.²⁴

In 2011, after the Deauville episode²⁵ and the early talk about the Greek debt private sector involvement, financial markets attacked Italian and Spanish sovereign bonds without any change in their fundamentals, showing the outcome of a domino effect that threatened to ultimately reach some core countries as a result of widespread contagion. In this perspective, talking about contagion, I highlighted in Constâncio (2011)²⁶: "...besides general risk aversion and own credit risk also the Greek credit rating affected other euro area countries' bond spreads in a statistically significant way, in a small magnitude for some countries such as France and in a larger magnitude for other countries such as Ireland, Spain, Italy or Portugal". The European monetary union was clearly facing then an existential crisis.

The ECB is the central bank of all member countries, and used the legal powers foreseen in its Statutes to combat the financial fragmentation that was impairing the transmission of the single monetary policy to all parts of the euro area. This involved conducting open market operations in secondary markets, including of sovereign bonds, to launch the Securities Market Programme (SMP) in 2010 and 2011 as well as announcing the Outright Monetary Transactions (OMT) in 2012. These initiatives put a stop to the sovereign debt liquidity crisis. At the same time, very sizable medium-term liquidity facilities were made available to the banks to stabilise the system.

²² See de Grauwe, P. (2011), "The Governance of a Fragile Eurozone", CEPS Working Document No. 346, May; de Grauwe, P. and Y. Ji (2013), "Self-Fulfilling Crises in the Eurozone: An Empirical Test", *Journal of International Money and Finance*, 34: 15-36; Grauwe, P.(2011), "The European Central Bank: lenders of last resort in the Government bond markets?", CESiFO Working Paper 3569, September; Buiter W. and E. Rahbari (2012), "The ECB as lender of last resort for sovereigns in the Euro Area" CEPR Discussion Paper 8974.

²³ See Corsetti, G., L. Dedola, M. Jarocinsky, B. Mackowiak and S. Schmidt (2016), "Macroeconomic stabilization, monetary-fiscal interactions and Europe's monetary union", ECB Working Paper 1988; Corsetti, G. and L. Dedola (2016), "The mystery of the printing press, monetary policy and self-fulfilling debt crisis", *Journal of the European Economic Association*, 14(6): 1329-1371; Lorenzoni G. and I. Werning (2013), "Slow moving debt crises", National Bureau of Economic Research Working Paper 19228.

²⁴ See Jarocinski, M. and B. Mackowiak (2017), "Monetary-fiscal interactions and the euro area's malaise", European Central Bank Working Paper 2072.

²⁵ The Deauville episode refers to the French-German agreement to organise Greek debt restructuring held by the private sector, announced in October 2010 after a meeting between the German Chancellor and the French President.

²⁶ See Constâncio, V. (2011), "Contagion and the European debt crisis", lecture by Vítor Constâncio, Vice-President of the ECB at the Bocconi University/Intesa Sanpaolo conference on "Bank Competitiveness in the Post-crisis World" Milan, 10 October 2011.

At the end of 2011 and beginning of 2012, we were lending to the Irish and Greek banking sectors more than 100% of GDP in the former and about 90% in the latter. A significant part of that lending was under the form of Emergency Liquidity Assistance (ELA), which is implemented by national central banks that also incur the respective credit risk but require a non-objection from the ECB Governing Council, from the perspective of monetary policy objectives. In this context, the Governing Council approved an ELA framework and established a set of procedures to harmonise several features and detailed reporting to the ECB, that must be respected. ELA was an essential temporary safety valve during the crisis, has a general financial stability role, beyond banking, for which national authorities are responsible²⁷ and, in my view, the present framework does not require further changes .

All the bold decisions taken during the crisis would not have been possible without the courageous leadership of Presidents Jean-Claude Trichet and Mario Draghi and it was my privilege to work as Vice-President with both throughout these eventful years. Those decisions saved the euro area and illustrate the importance of having leaders with their convictions at the helm of the ECB.

We were acting within our Treaty competences²⁸ and the programmes we conducted, the SMP, the OMT and the Asset Purchase Programme (APP), are now part of the permanent ECB toolkit, to be used if and when the situation so requires. From now on the ECB will have no excuse not to fulfil its mandate in addressing the impairment of the single monetary policy transmission by intervening in the sovereign bond market. The only alternative that could ensure equivalent results would be the general use of Eurobonds to substitute national sovereign debts, a solution that would require a Treaty change and a very advanced stage of political union.

The agreed and settled framework of asset purchase programmes stabilized the euro area and that would be disturbed by the introduction of a SDRM, with thresholds and automatism, or by simply strengthening the presumption of a debt restructuring whenever a country has to ask for an ESM programme. Contagion and self-fulfilling crises would return. In my view, the fact that the ESM legislation already foresees that a country must ask the Commission for a debt sustainability analysis before starting a country programme and that euro countries sovereign bonds are mandatorily issued with Collective Action Clauses, should be enough to dispel the concerns of the proponents of a SDRM.

Nevertheless, the discussion has continued and recent proposals have multiplied. In the recent German-French CEPR Policy Insight n. 91, already mentioned, a subtle

²⁷ This is made clear in the ECB answer to the European Parliament resolution on the ECB Annual Report, which states: "...it should be noted that the term "financial institutions" which is used in the ELA agreement aims to cover a broad range of potential ELA beneficiaries. It does not correspond to the definition of financial institutions in Article 4(26) of Regulation (EU) No 575/2013 (the Capital Requirements Regulation). This takes into account the fact that ELA is a tool which also serves financial stability purposes; this might go beyond the set of credit institutions established in euro area jurisdictions", document available at https://www.ecb.europa.eu/pub/pdf/other/ecb.20180409_feedback_on_the_input_provided_by_the_european_parliament.en.pdf?93cc41c170e7ce695812d30e4b0c51ea

²⁸ See the ECJ ruling about the Gauweiler case referring to the legality of the OMT: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:62014CJ0062&from=EN>

presumption of debt restructuring is also included. The authors recognize the sensitivity of the issue and write: “When introducing such a policy, it is essential to ensure that it does not give rise to the expectation that some of the present debts of high-debt countries will inevitably be restructured, triggering financial instability in debt markets.” However, as they recognise there is no simple solution to this transition problem. Some of the same authors jointly with a few others, in two CEPR publications dated from 2015 and 2016²⁹, had proposed to precede the introduction of the SDRM by an operation of legacy debt reduction. They were also more concerned with the transition and write that introducing immediately the SDRM: “would be dangerous, as the transition path would be highly destabilising. Imagine, for example, announcing the implementation of the debt restructuring mechanism ... in an environment where several countries are already highly indebted. The result could be a run on their debt. The way to deal with the transition path problem is a *quid pro quo*. We propose a coordinated, one-off solution to decrease the legacy debt in exchange for a permanent change in institutions”. The debt reduction would be funded by capitalised revenues from seigniorage or assigned taxes. Alternatively, in 2011, Daniel Gros and Thomas Mayer³⁰ proposed that the ESFS (future ESM) could buy the public debt of countries applying for a programme of financial assistance at market prices. In 2010, in a Bruegel Policy Brief, Delpa and Weizsacker proposed a partial mutualisation of sovereign debts. All these proposals would help to reduce the debt overhang of several countries which would have a stabilizing effect for the euro area. They seem, nevertheless, to be too far away from the realm of possibilities. It is doubtful that member countries would be willing to try a Faustian pact with a trade-off between debt reduction and a SDRM.

The reality is, however, that both types of proposals have disappeared from the more recent suggestions to strengthen debt restructuring schemes. On the whole, some sort of SDRM is an idea that several member countries could hardly subscribe to and that, in general, would be quite destabilising, contributing to aggravate potential redenomination risks that would be detrimental to banking union and capital markets union. As recently stated in Acharya and Steffen (2016 and 2017): “A functioning Capital Markets Union (CMU) ... needs a level-playing field in the holding and transacting of debt and equity securities by market participants in different countries. That is, a CMU with fully integrated capital markets can only work when the status of sovereign bonds as a risk-free asset is restored and the risk-free rate across euro area countries is equalized”³¹.

I do not think that it is necessary or desirable to equalise national sovereign bond rates. The important aspect to stress is that we cannot have a CMU without the existence of a European risk-free rate and the absence of significant financial fragmentation and redenomination risk. In this way, only the idiosyncratic credit risk

²⁹ Corsetti et al. (2015), “A new start for the Eurozone: dealing with debt”, CEPR Monitoring the Eurozone 1; Corsetti et al. (2016), “Reinforcing the Eurozone and protecting an open society”, CEPR Monitoring the Eurozone 2.

³⁰ Gros, D. and T. Mayer (2011), “Debt reduction without default?”, CEPS Policy Brief 233.

³¹ See Acharya, V. and S. Steffen (2016), “Capital Markets Union in Europe: why other unions must pave the way”, ZEW Policy Brief 4 June 2016; see also Acharya, V. and S. Steffen (2017) “The importance of a Banking Union and Fiscal Union for a Capital Markets Union”, European Commission, European Economy Discussion Paper 062.

should matter for asset valuations in any region of the monetary union without having to consider redenomination risk.

Completion of Banking Union

Completing the banking union would seem to be an easier goal to achieve. Launching the EDIS with a firm unconditional timetable and deciding on the fiscal backstop both for EDIS and the Single Resolution Fund (SRF), as proposed by the ECB in its Public Opinions, would be the logical steps in a project that all countries claim to support. The need for a backstop, both for EDIS and the SRF would recommend the merger of EDIS with the Single Resolution Mechanism (SRM) to form a sort of European FDIC, which would economise resources and the gathering of information.

A large amount of risk reduction has occurred in the past few years in the more vulnerable countries and their banking sectors. All countries have economic growth; all countries now have positive budget primary balances (the Spanish one is still slightly negative) and all show positive current accounts and their banks' capital ratios have significantly increased. Risk was also reduced with the Bank Recovery and Resolution Directive (BRRD), the practical disappearance of the ESM bank's recapitalization programmes that now require the previous application of the BRRD, the creation of the SRM, the implementation beginning of the Minimum Requirements of Eligible Liabilities (MREL) and the visible reduction of non-performing loans under the pressure of the ECB/Bank Supervision.

The truth is that so far the banking union project has been exclusively about risk reduction and no specific element of risk sharing within the project has been introduced.

In an exercise of changing the goalposts whenever the defined ones are on the brink of achievement, several stakeholders consider that more risk reduction has to be delivered before decisions about EDIS can be taken. Perhaps there are concerns that EDIS will imply significant transfers across countries in case of a new banking crisis. In the recently published ECB's Occasional Paper, simulating severe banking crises we precisely demonstrated that with proper risk-based contributions by banks cross-border subsidisation is negligible.³²

Another aspect of risk reduction refers to the holdings of domestic sovereign debt by banks. Indisputably, the credit risk situation of sovereigns affects banks via several channels, including the amount of debt they hold. However, the influence of the sovereign on national firms, both banks and non-banks, seems to be similar through the powerful effect that a sovereign in difficulties spreads to the whole economy.³³ Over time, for European countries, CDS premia of non-financial firms and banks are

³² ECB (2018) "Completing the Banking Union with a European Deposit Insurance Scheme: who is afraid of cross-subsidisation?" by Jacopo Carmassi, Sonja Dobkowitz, Johanne Evrard, Laura Parisi, André Silva, Michael Wedow, Occasional Paper n. 208, April 2018.

³³ Horny, G., S. Manganelli and B. Mojon (2016), "Measuring financial fragmentation in the euro area corporate bond market", Banque de France Working Paper 582.

impacted in a similar way when the country the sovereign credit rating severely deteriorates. During the crisis, CDS premia do not even show that banks with higher ratios of domestic public debt did significantly worse than others with lower ratios. It is difficult to presume that, with some degree of diversification, the situation of banks can be significantly disconnected from the sovereign position. This “macro channel” dominates the impact and also plays an important role when Credit Rating Agencies decide on banks’ ratings.

On the other hand, the literature points to some good reasons for a certain dose of home-bias, from information advantages to hedging against redenomination risk and the composition of their liabilities, to simple risk/return advantages. Additionally, in an IMF working paper Gennaioli et al. (2014) highlight that banks’ holdings could act as a disciplinary device for sovereigns that would be more inclined to take measures to avoid a default in view of its effects on domestic banks.³⁴

Another significant aspect relates to the recent empirical findings of Giuzio, Craig and Paterlini (2018)³⁵ that: “Using a sample of 106 European banks included in the EBA stress testing dataset over the period June 2013 to December 2015 ... find that a diversification requirement such as the ones proposed can actually increase the risk of the resultant portfolios, while having little effect on the tail-risk or contagion risk. Given that the reduction of risk is a major reason for a costly diversification requirement, results suggest caution before their adoption.” This result is intuitive if one thinks that diversification spreads lower quality securities over all the banks which is compound by adding network effects that the authors duly consider. Analysing the tail risk of portfolios, the authors conclude that: “the rebalanced and current portfolios show similar levels of tail risk, both for single countries and for the EU banking system, which means that rebalancing portfolios to increase diversification may be inefficient, even when correlation between sovereigns defaults is higher, as during a crisis.”

A last aspect to underline is that no country can reduce the accumulated stock of debt in a few years and has to ensure its annual rollover needs, naturally having to heavily rely on the holders of the redeemed debt. Some countries have to rollover several hundred billion euros every year. The issue therefore is not just about new debt flows, where things would be easier to change.

Despite all this, I have supported a change to positive risk weights for holdings of domestic debt in different fora. The weights would start at low levels and increase with the degree of concentration (measured by the ratio between holdings of domestic sovereign debt and Tier 1 capital), particularly above a ratio of 150%. The justification

³⁴ Gennaioli, N., A. Martin, and S. Rossi (2014), “Banks, government bonds and default: what do the data say? IMF Working Paper 120-2014; On other potential advantages of home bias see Fabozzi, F., R. Giacometti, and N. Tanchida (2015), “The ICA-based factor decomposition of the Eurozone sovereign CDS spreads”, IMES Discussion Paper 4; Choi, N., M. Fedenia, H. Skiba and T. Sokolyk (2017), “Portfolio concentration and performance of institutional investors worldwide”, *Journal of Financial Economics*, 123(1): 189-208; Broner, F., A. Erce, and J. Ventura (2014), “Sovereign debt markets in turbulent times: credit discrimination and crowding-out effects”, *Journal of Monetary Economics*, 61(C): 114-142.

³⁵ Giuzio, M., B. Craig, and S. Paterlini (2018), “Effects of diversification and capital buffers on the EU sovereign-bank networks”, mimeo in http://www.efmaefm.org/OEFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2017-Athens/papers/EFMA2017_0437_fullpaper.pdf.

for this threshold is twofold: first, the regulatory imposition related to the Liquidity Coverage Ratio (LCR), requires holdings of sovereign debt that represent an average close to 100% of Tier 1 capital; second, the radical reduction of the unsecured interbank market in favour of the use of secured transactions (repos) that mostly use sovereign paper, further increases the need for banks to keep a sizable portfolio of sovereign debt.

The gradualism of this proposal takes heed of these facts and would not upset the market for national sovereign debt too much, especially for countries with high rollover levels each year. Other proposals being floated around, either with quantitative limits or starting high “capital charges”³⁶ at low concentration levels could disrupt debt markets in the short-term, without much gain in terms of risk control as I underlined before. Even under the pressure of harsh regulation, diversification is not easily achieved on a voluntary basis. Banks in core countries since the crisis started have significantly reduced their exposures to banks in the periphery and will be reluctant to change their policy even as a consequence of higher costs to keep their portfolios of sovereign debt of their own countries. Finally, imposing high costs just for the euro area banks would be contrary to maintaining an international level playing field as other jurisdictions could not agree to any change in the present regulation. These points illustrate well that the proposals to introduce a stringent regulation to impose a quick change in banks’ holdings of domestic public debt, go beyond concerns with credit risk management. It relates instead to the objective of making a SDRM possible, which would be difficult to activate if it entailed large losses by banks with portfolios concentrated on the restructured debt.

Additional reforms to complete banking union must include harmonisation of insolvency laws, direct implementation powers to the SRM and the creation of a scheme of provision of liquidity in resolution that only the ECB can implement, with appropriate government guarantees as is the case in other jurisdictions.

Creating an European safe asset

The only good solution to achieve a degree of diversification in banks’ holdings of sovereign debt, is to introduce a new European safe asset, built on the basis of national sovereign bonds. This asset would have other, more important roles to play by creating a benchmark rate thereby making possible a Capital Markets Union with a sizable and deep European bond market.

I am not referring to the type of Eurobonds that would substitute national sovereign debts as would be a joint liability of member States, as this would require a deep

³⁶ See Veron, N. (2017), “Sovereign concentration charges: a new regime for banks’ sovereign exposures”, European Parliament Study.

political union. Among the various proposals put forward, I will concentrate on just two: a variant of the ESBies or SBBS³⁷ and the e-bonds as proposed in the Monti Report.³⁸

The current proposal of the SBBSs refers to a tranching, synthetic bond backed by national sovereign bonds. The proposal tries to demonstrate that the structure would assure a senior tranche with lower risk than German debt as a result of the diversification gains based on historical correlations. Market players and rating agencies have been sceptical of the instrument.

Their main concern is a perceived lack of diversification to ensure that the senior tranche can be indeed as safe as claimed because correlations among several countries' debt could increase in a stressful situation (as occurred during the financial crisis). Also, it may be difficult to sell the junior tranche at coupon levels that do not compromise fatally the overall economics of the synthetic security issuance. Indeed, if the junior tranche had to be placed at a relatively high coupon, then the senior tranche would need to offer a lower coupon than Bunds, a doubtful selling prospect. This would render the economics of the SBBS inviable, which would be very unfortunate.

These obstacles could be overcome if, for instance, a small first loss tranche were to be covered by a public guarantee, jointly provided by Member States. Such contingent liability could be limited to a reasonable level. The success of the synthetic European Bonds would have significant benefits for financial integration and for the banking and capital markets union. This would be my preferred solution.

The alternative of e-bonds issued by a European entity as a pure securitisation of sizable amounts of national sovereign bonds but with higher privileged credit status over them would be less efficient and could increase the cost of issuing the non-preferential part of pure national debt. This could even act as a disciplining device and would not necessarily imply an increase in the costs of the total debt issuance. For instance, according to a recent working paper of the Peterson Institute, in order to have an expected five-year loss rate of 0.5% or lower, the European entity could securitise 50% of a country's debt or 25% of its GDP.³⁹ The benefits of having a European safe asset would be enormous to strengthen the overall resilience of the euro area.

Creating a genuine Capital Markets Union

An integrated European bond market as a central piece of a Capital Markets Union (CMU) cannot ultimately exist without a European safe asset. A single term structure of risk-free interest rates could serve as a euro area pricing benchmark for the

³⁷ See ESRB (2017), "Sovereign bond-backed securities", ESRB High-Level Task Force on Safe Assets; the original proposal referring to ESBies was in Brunnermeier, M., L. Garicano M. Pagano, R. Reis, T. Santos, D. Thesmar, S. Nieuwerburg and D. Vayanos (2011), "European Safe Bonds", The Euronomics Group.

³⁸ See Monti, M. (2010), "A New Strategy for the Single Market", Report to the President of the European Commission, José Manuel Barroso, May 2010.

³⁹ For a good analysis of these and other proposals see Leandro A. and J. Zettelmeyer (2018), "The search for a Euro area safe asset", Peterson Institute for International Economics Working Paper 18-3.

valuation of bonds, equities and other assets. The safe asset could also be used as collateral, for example for repo and derivatives transactions across the euro area.

An advantage of a CMU is of course, the promotion of private income and consumption smoothing across the whole area, thus mitigating the effects of localised, recessionary episodes. The evidence shows that in the U.S., the three channels of income smoothing across states (public transfers, capital markets income and credit) are able to smoothen around 60% of economic income shocks, whereas in the euro area that number decreases to 20%.⁴⁰ The studies behind these findings normally use historical data that include periods of normality and, as a 2015 IMF working paper highlights⁴¹, risk sharing is significantly reduced in periods of severe downturns as a result of the quasi disappearance of the credit channel. This provides one rationale for the creation of a European fiscal risk sharing mechanism.

Perhaps even more important, the CMU project is highly relevant for economic growth. A deep and liquid market, both of debt and equity, would spur innovation and enable the development of an efficient venture capital market. This relates to the importance of boosting the euro area's capacity to engage in activities conducive to innovation and productivity growth on the wake of new investment. In the years since the Great Recession, the pace of productivity growth in Europe has been persistently slow. In fact, European productivity growth had already started to stagnate during the mid-1990s.⁴² Evidence increasingly suggests that while both banks and markets are important for the financing of economic growth, non-bank financial intermediation provides a relatively more powerful contribution to innovation and productivity-enhancing activities in modern sophisticated economies⁴³ also in the euro area.⁴⁴

Developing well-functioning capital markets which support economic growth across Europe requires a comprehensive approach with a much more ambitious agenda. To that end, Europe needs to boost the supply of equity finance. Policies which stimulate individual ownership of traded shares, such as reducing the tax advantage of debt over equity or enhancing financial literacy, can have a material effect on public equity markets in Europe. At the same time, because stock markets often penalise companies which undertake radical, but uncertain, innovative activities, the contribution of private equity – particularly in the form of early-stage venture capital finance – is indispensable, as a critical mass of angel investors who can provide financing for medium-size projects is also needed. Only with a deep, liquid market is it possible to launch IPOs of successful projects that can offset the losses with projects

⁴⁰ See ECB (2018), "Risk sharing in the euro area", Economic Bulletin 1/18.

⁴¹ Furceri, D. and A. Zdzienicka (2015), "The euro area crisis: need of a supranational fiscal risk sharing mechanism", *Open Economies Review*, 26(4): 683-710.

⁴² van Ark, B., M. O'Mahoney and M. Timmer, (2008), "The Productivity Gap between Europe and the United States: Trends and Causes", *Journal of Economic Perspectives* 22:25-44.

⁴³ Hsu, P., X. Tian and Y. Xu, (2014), "Financial Development and Innovation: Cross-Country Evidence", *Journal of Financial Economics* 112: 116–135.

⁴⁴ Kremer, M. and A. Popov, (2018), "Financial Development, Financial Structure, and Growth: Evidence from Europe", Special Feature A, ECB Report on Financial Integration in Europe.

that fail. I recently underlined⁴⁵ the importance of building a genuine by saying: “With CMU, we should aim to reach a situation where both issuers and investors enjoy the same basic legal rights concerning capital markets activity regardless of the EU country where they are located. The CMU project involves all EU member states but it is particularly important for the euro area member countries. It is a big waste to have taken the huge step to adopt a single currency and continue to forgo the benefits that could be reaped by creating a true banking and capital markets union. I believe that euro area countries should forge ahead in enhanced co-operation in order to achieve CMU more rapidly.

We should however, be well aware that CMU requires a European safe asset, the harmonisation of taxes on financial products, a convergence of company law, including on bankruptcy, the creation of a single rule book of regulation for markets activity and ultimately a European Single Securities Market Supervisor. The other big condition is a rock solid monetary union so that assets’ risks and returns are not significantly influenced by redenomination risk but exclusively by their idiosyncratic features. A heavy toll, I know, but I will believe that the CMU project is possible when I see authorities start making inroads in some of those difficult issues.”

A macro stabilisation function

A central fiscal capacity for the euro area has been identified as a necessary reform to correct a basic deficiency of EMU – the absence of appropriate macroeconomic management beyond monetary policy. The necessary central fiscal capacity has two elements: an effective institutional mechanism to ensure coordination of national fiscal policies in order to discuss and decide an adequate euro area fiscal policy stance; second, a complementary central Stabilisation Fund, that can take several different forms. I can be very brief in addressing this issue by referring to the recent IMF proposals⁴⁶ which I consider quite appropriate. Alternatives, in the form of a common unemployment reinsurance scheme or an investment protection scheme, are not so convincing.

What is necessary is a stabilisation fund in periods of significant shocks in the form of a “rainy-day” fund that would provide transfers to be used in public spending with high multipliers for maximum effect, like investment or income support to the unemployed. The European Stabilisation Fund (ESF) transfers should not permanently benefit the same countries and, to avoid moral hazard, the use of the ESF should be conditional on past compliance by countries with the existent fiscal rules. The design of the Fund should also include sufficient features to avoid disincentives in the implementation of

⁴⁵ See Constâncio, V. (2018), “Why EMU needs more financial integration” speech at the Joint Conference of the European Central Bank and the European Commission on Fostering banking union and capital markets union – a top-down or bottom-up approach?”, Frankfurt 3d of May.

⁴⁶ Arnold, N., B. Barkbu, E. Ture, H. Wang and J. Yao (2018), “A central fiscal stabilization capacity for the euro area”, IMF Discussion Note 18/03; Berger, H., G. Dell’Ariccia and M. Obstfeld (2018), “Revisiting the economic case for fiscal union in the euro area”, IMF Departmental Paper 18/03. See also Carnot, N., M. Kizior and G. Mourre (2017), “Fiscal stabilization in the Euro-Area: a simulation exercise”, CEB Working Paper 17/025.

structural reforms. Triggering the transfers should be automatically dependent on a threshold indicator based on the unemployment rate.

By collecting net contributions from the countries in good times, the scheme would also create incentives for a true countercyclical fiscal policy. The mechanism should be used both for asymmetric and symmetric significant shocks. The double dip in growth experienced in 2012-13 could have been significantly mitigated or avoided if such a European stabilisation function had been available. To be effective in such situations, the ESF should have borrowing capacity to temporarily overcome a potential lack of accumulated revenues.

The creation of this central fiscal capacity would be recognition that the efficient functioning of the monetary union is a common responsibility, while at the same time, smoothing out significant economic downturns that can originate dangerous economic and financial fragmentation among member states.

Stability Pact review

A crucial contribution towards a stable monetary union must come from the proper behaviour of member states in avoiding domestic imbalances and promoting healthy growth. The Stability and Growth Pact (SGP) and the Macroeconomic Imbalances Procedure (MIP) are two important instruments to nudge countries in that direction.

The SGP has been attacked over the years, from different perspectives, as being inefficient, but I concur the judgement of the independent European Fiscal Board (EFB) in its first Report that: “Despite imperfections and scope for improvement, the EU’s fiscal framework has helped make the euro area more stable”.⁴⁷ As I mentioned already, after years of pressure, practically all countries with higher imbalances during the crisis have now budget deficits below 3% and positive primary surplus. These primary surplus have to be kept going forward, in order to reduce the public debt overhang. The past adjustment was in certain cases, excessively harsh and contributed to the second recession in the euro area. This implies that the balance between the two main goals of the SGP, long-term debt sustainability and macroeconomic stabilisation, was not always well managed, particularly in 2011-2013.

The flexibility criteria introduced by the Commission since 2015 partly addresses that issue. Beyond that, the SGP grew in complexity over the years and would benefit from some simplification. A complete overhaul seems however, difficult to achieve. Nonetheless, the proposals to move for a simpler expenditure rule, combined with a gradualist debt rule deserves discussion as a possible long-term solution. Let me point out that the debt rule would need to consider a quite gradual path of debt reduction as a too demanding path would annul some benefits of the less procyclical expenditure

⁴⁷ European Fiscal Board (2017) Annual Report.

rule. Besides, models of optimal fiscal policy have shown that a slow reduction of public debt is preferable.⁴⁸

Meanwhile, the EFB's suggestions of strengthening the enforcement by introducing compliance conditionality in relation to the EU budget transfers, and streamlining the present framework are valuable and deserve implementation in order to enhance countries' fiscal discipline.

Conclusion

Let me conclude.

The European Monetary Union was a hubristic endeavour from the start, full of unprecedented ambition in historical terms. The initial minimalist design did not do justice to the wide-ranging implications of the project. The framework is not yet complete and is still risking existential threats.

A solid, effective monetary union requires national and European institutions that can ensure a cohesive economic and financial performance thus avoiding excessive imbalances, financial fragmentation and significant persistence of redenomination risk for member states. In turn, these features imply my order of priorities for the reforms I consider necessary: acceptance that the ECB has no excuses not to intervene in the sovereign bond market to deal with acute liquidity stress; creation of a central fiscal stabilization function for macroeconomic management, including a Stabilisation Fund; introduction of a European safe asset; completion of Banking Union; a quantum leap in creating a genuine Capital Markets Union, using and enhanced cooperation to speed up the process; an improved fiscal rule to discipline countries' fiscal policies.

Ensuring the conditions for a successful monetary union is an individual and collective responsibility of all member states. To date, some have benefited more than others from the project but its collapse would indisputably greatly harm all countries. As Barry Eichengreen once wrote, the collapse of the euro would be "the mother of all financial crises". The vested interest of all countries should be to create the institutional conditions that would avoid existential crises like the ones we went through since 2010. Letting new crises develop and then implementing last-minute interventions under duress will always be more expensive.

Contrary to the views of sceptics, the euro area has undergone a substantial part of this journey since 2010. The remaining efforts are both necessary and technically not difficult to implement. As I said initially, in presenting my views, I did not consider issues of political economy feasibility. However, this does not mean that I adopted a maximalist view of desirable reforms. Note, for instance, that I did not mention in my list the necessity of a full-fledged fiscal union with permanent fiscal transfers, policies

⁴⁸ See Barro, R.J. (1979), "On the determination of the public debt", *Journal of Political Economy*, 87(5): 940-971. Schmitt-Grohé, S. and M. Uribe (2004), "Optimal fiscal and monetary policy under sticky prices", *Journal of Economic Theory* 114(2): 198-230; Adam, K. (2011), "Government debt and optimal monetary and fiscal policy" *European Economic Review*, 55(1): 57-74.

to ensure a closer convergence of real incomes across member countries or institutional governance reforms involving the Eurogroup or the European Parliament.

This implies that my proposals are not just the musings of a deluded technocrat aiming for perfection. I take into account the socio-political consequences of the way Europe addressed the crisis as well as the other causes that have resulted in the growing trends towards authoritarian nationalism, illiberal democracies and populist demagoguery that endanger our European values. I also know that responsible politicians are well aware of these dangers and that they cannot be defeated by adopting pure national interest strategies.

I also understand how difficult it is and why President Macron is talking about the need for “political heroism”⁴⁹ in calling for “... a re-creation of a sovereign, united and democratic Europe.... Only Europe can, in a word, guarantee genuine sovereignty or our ability to exist in today’s world to defend our values and interests.”⁵⁰

Indeed, these are not technocratic goals but vital political necessities for a European Union that should protect our citizens in terms of safety and prosperity. Our nations tied themselves to the Odyssean mast of monetary union and endured mighty storms to survive and pursue the journey towards a peaceful and prosperous destination. We must persevere in our aims. We must complete what is missing. We must achieve what is essential. Our Penelope is still waiting.

Thank you for your attention.

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⁴⁹ See President Macron’s interview to the Spiegel online on October 13, 2017, available at <http://www.spiegel.de/international/europe/interview-with-french-president-emmanuel-macron-a-1172745.html>

⁵⁰ Macron, E. (2017), “Initiative for Europe”, speech at The Sorbonne, 26 September.

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